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THE MONROE DOCTRINE IN ITS TERRITORIAL EXTENT AND APPLICATION.

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When in 1899 the Peace Conference at the Hague was perfecting the convention for the peaceful adjustment of international differences, and came to Article 27 upon the duty of calling the attention of powers which might thereafter disagree, to the existence of the International Court of Arbitration, the American delegates insisted on placing on record over their signatures the following declaration: "Nothing contained in this Convention shall be so construed as to require the United States of America to depart from its traditional policy of not entering upon, interfering with, or entangling itself in the political questions of international administration of any foreign state, nor shall anything contained in the said Convention be so construed as to require the relinquishment, by the United States of America, of its traditional attitude toward purely American questions."

The term, "traditional attitude toward purely American questions" was understood by every member of the conference to mean the Monroe Doctrine; and this solemn reservation seems to assume that there is a definite body of principles, universally

recognized, as to the relation of the United States to the rest of America. The truth is, however, that this abacadabra of American international policy has not now, and never has had, unalterable and unmistakable meaning; the powers especially interested in it have never fixed upon a common understanding; and even within the United States, several widely different theories are current as to the principles which the Doctrine originally contained, and as to its application to circumstances not then contemplated. There is still more uncertainty and conflict of authority as to the geographical extent of the Doctrine: some people extend it to the whole of the two Americas, including all European colonies; some confine it to the fragments of the Spanish and Portuguese empires; and some carry it only as far as the Amazon. Indeed, both in its extent and intent, the Monroe Doctrine is not a term but a treatise; not a statement but a literature; not an event but an historic development. The term Monroe Doctrine has at various times been set up as precluding every form of interference by European powers, from kidnapping a policeman to conquering an empire; and to every parcel of territory from the Pribyloff Islands to Tierra del Fuego. Wu Ting Fang, then Chinese minister to the United States, even suggested in 1900 that "The Monroe Doctrine being the fixed policy of your government, the national logic is that it should be applied to that part of the world where this country has possessions"—that is that it should be understood to protect the shores of Asia against the European political system. The inquirer into the territorial extent of the Monroe Doctrine feels like Little Billee at the end of his prayer:

> "But he scarce had got to the twelfth commandment,
> When up he jumps. 'There's land I see!
> There's Jerusalem and Madagascar and North and South Amerikee!'"

In view of the growing habit of appeal to this famous Doctrine, there is a need of charting the shores which it encompasses like an impassable barrier reef; a safe judgment as to the possibility of drawing a line within America, beyond which the Monroe Doctrine shall not apply, can be found only by going back to the historical sources to find from them what have been the intentions and expectation of American statesmen as to the territorial reach of the Doctrine. This can be better understood after a brief analysis of the Doctrine as Monroe put it forth, to see how far it was of general application, how far it might bear only on a part

of America, and how far it is extensible to other parts of the world. Recent critical studies of the Monroe Doctrine, especially those of Worthington Ford and Reddaway, tend to establish a larger meaning for the Doctrine both in principles and in territorial operation than has been assigned to it by a group of writers who appear to have been originally influenced by Richard H. Dana, in the notes to his edition of Wheaton's *International Law*.

PRINCIPLES OF THE MONROE DOCTRINE.

Paradoxically, the Monroe Doctrine has always applied less to other parts of America than to the United States itself. In the minds of John Quincy Adams and his compeers, it was intended to prevent disturbances to our institutions, and to minimize dangers to which the United States might be exposed. Let us not deny to our grandfathers a sincere and hearty interest in their new Latin-American neighbors, or a warm desire and expectation that they would build up for themselves a better government than Spain had ever given them. Did they not have congresses and federal states and supreme courts just like their model? In supporting their claims, in recognizing their independence, in standing for their security from interference, Monroe and other generous spirits felt that they were keeping alive the flame of liberty.

Nevertheless the flame of liberty within the United States concerned the people of that country most, and they felt that they were maintaining singly the great principle of democratic government. In France the Republic of the Revolution existed in spirit only during two years from 1793 to 1795; and in form, only till the proclamation of the Empire by Napoleon in 1804; while Switzerland, San Marino and Andorra, the only European republics which lasted through the storm, were not influencing the world. Hence the new Latin-American States seemed to be the first fruits of the principles of our own American Revolution.

In 1823 there was still an apprehension that European nations might combine to diminish the power of the United States and to discredit its republicanism, a fear that had some grounds in view of the reaction which took place in Europe after the fall of the French Empire, and the disposition to ascribe the misfortunes of the period to the pernicious desire of men of low social condition to have a share in governing themselves, and inciden-

tally in governing their political betters. If the movements of 1820 in Naples and Spain, directed not so much toward republics as toward making the monarchies decent, called for the intervention of the allied great powers, why should not the United States surmise that, as a republic, it was the object of hostility from Europe? The government of England was the only one which at that early period had glimmerings of the potentialities in a good understanding with the United States; and, partly for that reason, was looked upon with suspicion by the rest of Europe.

So far as the Monroe Doctrine was a protest against monarchy, there is no evidence in the United States of a prejudice toward American monarchy; Monroe hastened to recognize the short-lived Mexican Empire of Iturbide in Mexico; and the Empire of Brazil was usually on friendly terms with the United States from its inception in 1822 to its downfall in 1889. Nor has the United States ever hesitated to recognize such practical monarchies as the despotisms of Santa Anna in Mexico and Guzman Blanco and Castro in Venezuela, which perhaps remind us cogently of some forms of government which the people of the greatest of republics set up, or permit to be set up, within their own states and cities. Surely a people who complacently see a boss transferring his power to a son or a kinsman, or abdicating when weary of the sceptre, could urge no serious objection to a Latin-American monarchy, so long as the rivals of the despot cannot "control the primaries," and thus prove the weakness of his rule. Yet there was in Monroe's message of 1823 a sincere protest against the "European political system" by which he meant not kingship *per se*, but the Spanish monarchy, which was reaching a long arm across the Atlantic Ocean to recover lost provinces, with the backing of a combination of other monarchies which felt that the Latin-American Revolution threatened time-honored institutions. Monroe at one time desired his message to be an eagle's scream directed at arbitrary government in other parts of the world; and Adams in November, 1823, defied the European "political principles" in a despatch to the Russian government, from which power had emanated the objectionable term. Yet the Monroe Doctrine, so far as it was directed against monarchy at all, lost vitality as the decades brought about fundamental changes in the European conceptions of divine right, the eventual triumph of republican government in France, and even the breaking down

of autocracy in Russia. The protest against the "political system of Europe" in Monroe's message was an appeal, not against one-man power, but against a mutual political insurance company, which had been set up by the four great powers of continental Europe, and which threatened to take out a policy on the American colonies in behalf of the Spanish monarchy.

A favorite commentary on the Monroe Doctrine has been that the pernicious influence of the "European political system" was indirectly diffused through their American colonies. In the days when Canadian newspapers advertise "American Bowling Alleys," —meaning thereby bowling alleys of a type common in the United States and unusual in British America—we do not quite realize that in 1823 the United States was only the second American power in territory, and the fourth in military and naval strength; for Great Britain had a larger unquestioned area in America than the United States, and Great Britain, France, and Russia were all much more powerful military nations. The framers of the Monroe Doctrine, however, recognized this state of things; and, according to the testimony of John Quincy Adams, of Daniel Webster, and of other contemporaries, it was never the purpose of that Doctrine to shake the foundations of the European colonies still existing in America in 1823, especially in view of the fact that the people of those colonies were quite satisfied to be dependent. The Doctrine was intended to make a distinction between such continuing colonies and those Spanish and Portuguese colonies who had thrown off their allegiance, and in their own behalf and by the weight of their own arms had achieved actual though precarious independence.

In truth, in 1823 there was no longer a Spanish Empire, except the two fragments, Cuba and Porto Rico, which the United States showed no disposition to consider out of accord with the principles of the Monroe Doctrine, so long as they remained Spanish. On the other hand, the French in the West Indies, the English in the West Indies and Canada, and Russia in the far Northwest were not included in the original Monroe Doctrine; because it was recognized that England, France, and Russia were American powers, with all the rights necessary for the protection of their territorial holdings. Nobody then thought that there was anything incongruous between the Monroe Doctrine and European possessions in America.

Yet within the limited field to which the Doctrine was intended to apply, the United States from the beginning held itself to be on a different footing from those European-American powers. In the first place, as a republic, it felt a greater interest in and understanding of the neighboring republics. In the next place, our nearness to several of the new American powers gave a special importance to commercial relations, for from the beginning great expectations were entertained of the profits of the South American trade. In the third place, the idea of an isthmus canal was already in men's minds. In the next place, Adams conceived, although he did not set it forth distinctly in the Monroe Doctrine, that by the recognition of some of the Latin-American powers, which had been accorded a few months previously, the United States created a presumption in favor of those states which it would be unfriendly for other countries to dispute. That is, since the United States officially believed that the Latin-American states were independent, to take any steps against that independence was a questioning of our good judgment and truthfulness. For all these reasons the United States asserted for itself a status in America which was many years afterwards fitly phrased as one of "paramount interest."

To fortify this special interest, Monroe re-stated as follows a principle already familiar: "Our policy in regard to Europe is not to interfere in the internal concerns of any of its powers. But in regard to these continents circumstances are eminently and conspicuously different. It is impossible that the allied powers should extend their political system to any portion of either continent without endangering our peace and happiness." This is the famous "doctrine of two spheres," which up to the recent Spanish war was almost always quoted by anyone who wished to state or emphasize the Monroe Doctrine. It is one of those comfortable and convenient generalizations which act perfectly until a change of circumstances comes about to disrupt them. The first difficulty in the theory has already been pointed out, namely that several European powers retained colonies in America which must make them interested parties in many American questions; for instance, the British Colonies of Jamaica and Belize gave to that power a lively interest in all phases of the Isthmus question; the possession of Alaska led the Russians to claim the coast farther south; a footing in the West India Islands gave

color to French conceptions of especial interest in Cuba. Nevertheless, so long as the United States was practically outside of the questions which occupied Europe, it was easy to make a virtue of withdrawal from European concert, although the steady movement of immigrants and commerce across the ocean, the transmission of art and literature, the counter-movement of American political ideas, early began to obliterate the imaginary line drawn north and south through the Atlantic Ocean which cut off America from Europe.

In its essence, then, the Monroe Doctrine was founded upon the idea of a territorial division of the world into two politically separate hemispheres and did not much concern itself with subdivisions in the new world. Its underlying principle was simply that, for the protection of the United States from difficulty and danger, the territorial status of America must be considered as already adjusted. The colonization clause of Monroe's message reads: "The occasion has been judged proper for asserting as a principle in which the rights and interests of the United States are involved, that the American continents by the free and independent condition which they have assumed and maintain, are henceforth not to be considered as subjects for future colonization by any European powers;" and this accords with Adams's instructions to Rush, our minister in England, four months earlier: "A necessary consequence of this state of things [the destruction of the Spanish empire] will be, that the American continents henceforth, will no longer be subjects of colonization." This meant that the boundaries of America, so far as European powers were concerned, had already become crystallized; and, therefore, any extension of the influence of those powers, either at the expense of organized communities, or by taking up territory claimed to be wild and unoccupied, was contrary to the spirit of the Monroe Doctrine. This sacredness of existing American boundaries was, however, still subject to two important reservations. In the first place, the United States did not undertake to protect any of its neighbors either against disintegration into smaller fragments, or against absorption by each other; and both these processes began immediately. Still more important, the Monroe Doctrine was never a guarantee against ambitious designs of the United States itself; and in the thirty years after Monroe's message, the boundary of the great republic was carried far to the Northwest and Southwest.

One other territorial point remains to be noticed: the Monroe Doctrine is silent on the question of the transfer of a colony from one European power to another, and such transferences had been frequent throughout the two centuries previous. To say nothing of the extinction of the Swedish, Dutch, and French possessions on the continent of North America, nearly every West India island had been at one time or another under the flag of some other power than that which possessed it in 1823; and the three Guianas, English, French, and Dutch, had gone through various permutations including the whimsicality that Dutch Guiana or Surinam had been English, and English Guiana had been Dutch. As a matter of fact, the practice of passing islands back and forth, like small coins across a gaming table, was gone by, and the only region in which such a transfer of colonies was likely to give trouble was Cuba.

The main principle of the Monroe Doctrine was pretty accurately summed up in 1858 by Stephen A. Douglas: "This declaration assumed the name of the Monroe Doctrine; and it has frequently been appealed to by American statesmen as a rule to be inflexibly adhered to, whenever any European power has threatened or attempted to extend its dominions upon the American Continent —North, South, or Central America. This doctrine did not contemplate any interference on the part of the United States with the existing right or colonial possessions of any European power, but was a protest against the extension of their power and policy in the future." In fact the Monroe Doctrine was intended to prevent in America exactly what has happened in Africa, the parceling out of a continent among European powers whose rival pretensions of interest cause friction which would not otherwise come into being. Or perhaps a closer analogy would be to say that the Monroe Doctrine has protected America against the fate of Asia,—the taking over of weak civilized communities by stronger and more aggressive nations. In Africa there is no native state which can effectively criticize the process; but the present attitude of Japan toward Asia is in effect much like that of the United States eighty years ago toward America; the Japanese wish to prevent the creation of centers of irritation in Asia, because the contests of European nations there would disturb the security of Japan.

To the lively and sanguine mind of John Quincy Adams there

was doubtless associated with the Monroe Doctrine the idea that the United States was to be a political leader among the Latin-American powers; and this is proven by his readiness to go into the Panama Congress of 1826, and there to take part in discussions of problems of inter-American interest. But from the first John Quincy Adams had less confidence than Monroe in the future stability of the new states, and the country at large had less confidence than he; so that the opposition to Adams prevented him from giving to our delegates in the Congress the leading position which the other American states seemed disposed to accept. It was not till the Secretaryship of Mr. Blaine in 1881 that a second attempt at establishing the hegemony of America was made.

Whether the Monroe Doctrine involved the use of force, if necessary for the protection of American powers against Europeans, was for many years hardly discussed. The Latin-American States naturally supposed that their greater neighbor was ready to fit out fleets and armies in their behalf, but when Adams announced in 1826 that the American states were simply to concert measures how each might defend itself, it became evident that the United States had not the slightest intention of using force unless for the protection of its own immediate interests against evident danger. The European concert within a few months broke up over the question of Greece, and has never been re-organized with the same vitality; and at the same time the Spanish-American states showed in their long struggle with the Spaniards that they were able at least to defend their own territory. As a matter of fact the only powers except Spain which have ever carried on systematic war with any Latin-American state are the United States in the forties and France in the sixties; and the power which has most frequently made military demonstrations or expeditions to secure indemnity for wrongs or supposed wrongs has not been a European nation, but Monroe's own land.

The last question as to the meaning of the Monroe Doctrine is whether it is a part of international law. Many efforts have been made to show the truth of the saying of the European statesman that "Non-intervention is a diplomatic phrase which means intervention"; or, to paraphrase it, the United States reprehends interference in America to such a degree that it will, if

necessary, interfere to prevent interference. In its more recent applications the United States has so far enlarged the Monroe Doctrine as to include a right to prevent collisions between European and American powers which do not in any way affect their destinies or disturb their political system. Such was the attitude of the United States on the Venezuelan boundary, and on armed interventions for the collection of debts in Venezuela and the United States of Colombia. That Providence which is solicitous "for little children and the United States of America" may admit the kinship of this later practice with the original Monroe Doctrine, although it is a means of preventing difficulties not foreseen by Monroe; and it is true that such an attitude of the United States makes for peace within the walls of America. But not Providence, not ambassadors, not a Hague conference, can make it a principle of international law that a nation has an established right to prevent other nations from shaking their fists in the faces of little neighbors. It is the old problem of the impotence of the Almighty "to make a two-year-old mule in a minute." That no nation can set up a unilateral international law is clearly implied in a remark of President Roosevelt in 1903.

"The Monroe Doctrine is not international law, and though I think one day it may become such, this is not necessary as long as it remains a cardinal feature of our foreign policy and as long as we possess both the will and the strength to make it effective."

PERIODS OF DEVELOPMENT OF THE MONROE DOCTRINE.

Whatever the relation of the Monroe Doctrine to international law, its geographical extent must be sought in the statements of those who made the doctrine, or who have been called upon to apply it; and therefore it is necessary to compare the recorded utterances upon this subject, decade by decade, with the map of the Americas. Eight different epochs of public opinion upon this subject may be distinguished. (1) The first is the period from 1787 to 1815, in which the fierce conflict between two groups of European powers aroused American statesmen to the importance, for their own safety, of keeping out of the maelstrom of European politics. (2) The second epoch, from 1815 to 1826, is that of the liberation of the Spanish and Portuguese colonies and of the first distinct formulation of the Monroe Doctrine.

(3) In the next period, from 1826 to 1843, there was little discussion of the subject and the United States several times failed to protest against intervention by foreign powers. (4) Then in 1844 began a fourth epoch, lasting till 1860, during which the main interest in the Monroe Doctrine was to squeeze from it a meaning which would interfere with foreign aggressions in Latin-America, while permitting the United States to annex such portions of that territory as was thought desirable; and the question of an Isthmus canal began to tangle itself with the general discussion. (5) A fifth epoch, from 1861 to 1875, furnishes the first concrete example of an attempt to found a European colony on the ruins of an American state, Mexico; and the Isthmus canal and Cuban and other West Indian questions opened up a new territorial discussion. (6) In 1879 began a sixth epoch which lasted about fifteen years and in which the principal issue was the status of the Panama canal. (7) In 1895 began a seventh period, during which the Monroe Doctrine was pushed to a point never before reached by Secretary Olney in his despatches on the Venezuelan question; and soon after followed the American annexations of the Spanish war. (8) Since the war there has been an eighth era, in which President McKinley, President Roosevelt, Mr. Hay, and Mr. Root have re-stated and somewhat amplified the Monroe Doctrine, so as to resent a threatened colonization by Germany, and to include the collection of debts.

I. DOCTRINE OF ISOLATION (1782-1815).

To print or even to excerpt any considerable part of the statements made by American statesmen bearing on the territorial scope of the Monroe Doctrine would be a task too long for this article; but some representative extracts within each of the eight fields or periods mentioned above may serve as a basis for safe deductions. The first conception clearly to evolve was that of the Two Spheres, often called the Doctrine of Isolation, of which the germ can be discovered before the end of the Revolutionary war. Thus John Adams recorded November 18, 1782, a conversation with the British peace commissioner at Paris: "'You are afraid,' says Mr. Oswald to-day, 'of being made the tool of the powers of Europe.' 'Indeed I am,' said I. 'What powers?' said he. 'All of them,' said I. 'It is obvious that all the powers of Europe will be continually maneuvering with us to work us into their

real or imaginary balances of power. They will all wish to make of us a make-weight, when they are weighing out their pounds. Indeed, it is not surprising, for we shall very often if not always be able to turn the scale. But I think it ought to be our rule not to meddle; and that of all the powers of Europe, not to desire us or, perhaps, even to permit us if they can help it.'" The same idea was expressed after the peace by Thomas Pownall, formerly a Colonial governor and always a clear-sighted friend to America (which he called "The Empire of the United States") in his "Memorial to the Sovereigns of America." He lays down "a maxim (rather a fundamental Principle) of American Politics. . . That as Nature hath separated her from Europe and hath established her alone (as a Sovereign) on a great Continent, far removed from the old world and all its embroiled interest, it is contrary to the nature of her existence, and consequently to her interest, that she should have any connexions of Politics with Europe other than merely commercial."

Another branch of the doctrine of two spheres was put forward by Alexander Hamilton in the Federalist in 1787: "By a steady adherence to the Union, we may hope, erelong, to become the arbiter of Europe in America, and to be able to incline the balance of European competition in this part of the world as our interest may dictate." The other side of the two spheres theory was emphasized independently by Washington, January 1, 1788, when he wrote: "An energetic general government must prevent the several states from involving themselves in the political disputes of European powers." The principle was re-stated by Washington in his Farewell Address of 1796, a paper which has had a powerful influence on American conceptions ever since: "Europe has a set of primary interests which to us have none or a very remote relation. Hence she must be engaged in frequent controversies, the causes of which are essentially foreign to our concerns. . . . . Our detached and distant situation invites and enables us to pursue a different course. . . . . It is our true policy to steer clear of permanent alliances with any portions of the foreign world." The essential difficulty in this artificial division of the world was noticed by President John Adams in a message of May 16, 1797: "Although it is very true that we ought not to involve ourselves in the political system of Europe, but to keep ourselves always distinct and separate from it if we

can. . . . . the maritime and commercial powers of the world will consider the United States of America as forming a weight in that balance of power in Europe which never can be forgotten or neglected."

When Jefferson became President, though he discovered that our ministers abroad were inclined toward understandings with European powers, he repeated Washington's principles in a message of October 17, 1803: "Separated by a wide ocean from the nations of Europe and from the political interests which entangle them, together with productions and wants which render our commerce and friendship useful to them, and theirs to us, it cannot be the interest of any to assail us, nor ours to disturb them."

While Jefferson was writing these words, he was already caught in the cogs of European war, which compelled him to take an absorbing interest in European affairs; while at the same time two questions arose which changed the face of America and put upon the United States new responsibilities toward other parts of the two continents. The first of these questions was Oregon, a region in which Jefferson had taken an extraordinary interest ever since he first heard of Captain Gray's discovery of the mouth of the Columbia in 1792; and it was due to his urgency that Lewis and Clark reached the Pacific in 1805, and thereby established a second ground of claim to the Northwest coast, as a region heretofore unoccupied by civilized men and therefore open to American settlement. But this claim to Oregon collided with those of Spain, Russia, and England; so that the United States for the first time came forward as an American colonizing power, in rivalry with the great powers of Europe.

The other new influence in American diplomacy was the growing weakness of the Spanish empire in America. As early as 1792 Hamilton predicted that war with Spain would result from territorial controversies; although Jefferson in an instruction of July 28, 1791, to Short, our minister in Spain, wrote: "Whenever jealousies are expressed as to any supposed view of ours in the division of the West Indies, you cannot go farther than the truth in asserting that we have none. If there be one principle rooted more deeply than any other in the mind of every American, it is, that we should have nothing to do with conquest." The treaty of 1795 fixing the Southwest boundary postponed the inevitable clash between the two countries.

The most immediate object of controversy between the two powers was Louisiana, and when in 1800 that province was transferred to France, the germ of the Monroe Doctrine appeared in the decisive action of Jefferson for securing the east bank of the Mississippi, and in the voice of the country against allowing a transfer to a more powerful European nation. In 1807, Spain was made practically a dependency of France, including (as the French understood it) the transfer of all the Spanish colonies, and consequently insurrections broke out in many parts of Latin-America, Jefferson foresaw the disintegration of the Spanish power and the consequent creation of a new set of political and commercial relations.

A curious paper, over the signature of Gen. James Wilkinson and addressed to Jefferson, under date of 1808, which apparently has never been printed, exists in the archives of the state department. Wilkinson predicts that "Mexico, Peru, and Cuba [would be] formed into independent states"; he points out that they must not be allowed to pass under the domination of European powers other than Spain; and he suggests a great American confederation, "the grandest and most charming spectacle in Nature. The liberation of the American continent from the shackles of European government and the Nations of the West forming a distinct community, connected by the bonds of Friendship and mutual interests, and united for their common protection, defense, and happiness." As for trans-Atlantic relations, he would simply cut them off, commerce and all. It seems likely that Jefferson was somewhat influenced by this memoir in writing to Governor Claiborne, of Louisiana, October 29, 1808, with reference to the revolt of the Spanish colonies: "If they succeed we shall be well satisfied to see Cuba and Mexico remain in their present dependence, but very unwilling to see them in that of either France or England, politically or commercially. We consider their interests and ours as the same, and that the object of both must be to exclude all European influence from this hemisphere."

For the first time Cuba now emerges as an object of the diplomacy of the United States. In the confusion of European affairs, direct Cuban trade was opened up and proved so profitable that Jefferson for the moment thought of securing that island as the share of the United States in the Spanish colonies, and would

at the same time have annexed Canada, "Then," said he, "we should have such an empire of Liberty as she has never surveyed since the creation." Nevertheless he draws a limit to his own ambition. "I would immediately erect a column on the southernmost limit of Cuba, and inscribe on it a *ne plus ultra* as to us in that direction."

Jefferson a few weeks later was out of office, and Madison, his successor, was confronted with the immediate issue of West Florida. In November, 1810, he laid down in a message to Congress the highly significant principle that "the United States could not see, without serious inquietude, any part of a neighboring territory, in which they have, in different respects, so deep and just a concern, pass from the hands of Spain into those of any other foreign power"; and on March 3, 1811, Congress passed a formal resolution almost in the President's words. This official statement of public policy antedates Monroe's by thirteen years, and includes a principle not clearly laid down in the Monroe Doctrine, namely, that American territory is not to be transferred from one European power to another. The war of 1812 and the end of the Napoleonic wars for the time settled or postponed the various questions raised by Jefferson and Madison; Canada remained unconquered; and Cuba remained Spanish, while West Florida was annexed by force of arms to the United States. In 1815, therefore, neither the doctrine of the two spheres nor that of fixed boundaries in America was established. International trade returned to its old channels; and except for the transfer of Louisiana from France to the United States in 1803, America was still to a large degree politically a part of Europe.

Though the Spanish colonies professed to resume their allegiance to the restored Bourbon power in Spain after 1814, as a matter of fact Buenos Ayres never readmitted Spanish authority; and serious revolts again broke out in other Spanish colonies. Nevertheless the Spanish Viceroys had the best of it till, in 1817, a new wave of revolution, set in motion by General San Martin, swept across the Andes from Buenos Ayres into Chile. A similar movement in New Granada, headed by Simon Bolivar, was successful in 1819; and the two chieftains united their forces for the liberation of Peru in 1821. An independent movement in Mexico destroyed the Spanish power there in the same year;

and in 1822 Brazil was formally set up as an American empire, having no relation to Portugal. Thus, throughout the whole extent of the Spanish and Portuguese dominions on the mainland of both North and South America, the authority of the mother countries was extinguished, except in a few fortified seaports, and it has never been restored.

II. THE ORIGINAL MONROE DOCTRINE (1815-1826).

The way was at last opened for the development and statement of a comprehensive principle with regard to the territorial status of America. The doctrine of the two spheres had very little force so long as the greater part of both American continents was politically a part of Europe, so that their commerce, diplomacy, political policy and official personnel, all came from over seas. Up to 1820, whenever people talked of an "American sphere" and "American isolation," they meant no more than that the United States was free to take care of her own affairs in America. The principle that territory must not be transferred from one European power to another was suggested in 1803, and again in 1810,—but in both cases it was some particular territory that we hoped to acquire. The revolt of the Spanish colonies, however, opened up a new field of diplomacy, for the first time made possible the combination of native American states, and put the holders of the remaining European dependencies upon the defensive.

Just at this crisis Monroe became President, March 4, 1817; and John Quincy Adams was designated as his Secretary of State. Never till the present decade has the United States had such a glorious field for diplomacy: in Europe a syndicate of great powers undertook to rule the world; in America a complexus of feeble powers looked to the United States for sympathy, commerce, recognition, aid, and comfort. At the same moment the Oregon question was presented in a new form, through the preposterous claims of Russia; and our relations to Florida were such as to make necessary a treaty with Spain for its cession, as the alternative of war. In such troubled seas it was hard to keep an even keel, and the genius of the greatest secretary who has ever sat in the State Department, except perhaps Mr. Hay, and the experience and judgment of President Monroe were both tested to the utmost.

The key to the interlocked problem was our diplomatic attitude to the new Latin-American States. Madison's policy was one of scrupulous neutrality; but, as the United States found out in 1861, to recognize the neutrality of a revolted community is to give it a status among nations. Therefore, by sending special commissioners to make investigations, by authorizing irregular commercial representatives, by freely trading with the Spanish-Americans, by receiving their privateers in our ports, the United States practically recognized the existence of a body of territory in America which was no longer European. Meanwhile Henry Clay pushed with all his force and popularity for a formal recognition of the independence of the new States, till in 1822 Congress authorized an appropriation of money for the salaries of ministers; and in the course of 1822 and 1823 four of the new countries were formally recognized by President Monroe as free, sovereign, and independent communities.

The Florida question was settled by the treaty of 1819, in which that province was definitely ceded to the United States. In 1821 the treaty was consummated, and thereby another evidence was given that the United States was acquainted with no principle which forbade the transfer of European possessions to itself.

One clause of the treaty of 1819 bore upon the third of the pending questions, Oregon; the Spaniards formally released all claims on the Pacific coast north of the forty-second parallel, and thereby cleared the way for resistance by the United States to the growing pressure of Russia. In the meantime, Great Britain, the only other claimant, in 1818 entered into a treaty for joint occupation of Oregon with the United States, and thus added the weight of her influence against the Russian claims. By a ukase of 1821, the Czar claimed exclusive rights "all along the northwestern coast of America from Behring Strait to the fifty-first parallel of northern latitude. . . . . No foreign vessel shall be allowed either to put to shore at any of the coasts and islands under Russian dominion, as specified in the preceding section, or even to approach the same to within a distance of less than 100 Italian miles." At the same time the Russian government especially interested itself in the continued claim of Spain to its former American empire.

This was an opportunity for John Quincy Adams, who, October

2, 1820, in an interview with the British minister, recalled the two spheres doctrine by a comment on "the general-extra-European policy of the United States—a policy which they had always pursued as best suited to their own interests and best adapted to harmonize with those of Europe." As to Russia, Adams said, "I find proof enough to put down the Russian argument; but how shall I answer the Russian cannon?" In February and March, 1822, Adams emphatically informed the Russian minister that we could not recognize their exclusive claim; and on July 22, 1823, he wrote to Minister Rush: "The application of colonial principles of exclusion, therefore, cannot be admitted by the United States as lawful upon any part of the northwest coast of America, or as belonging to any European nation. Their [the United States'] own settlements there, when organized as territorial governments, will be adapted to the freedom of their own institutions, and, as constituent parts of the Union, be subject to the principles and provisions of their constitution." Five days earlier he had formally stated the same doctrine to the Russian minister: "Baron Tuyl came. . . . . I told him specifically that we should contest the right of Russia to *any* territorial establishment on this continent, and that we should assume distinctly the principle that the American continents are no longer subjects for *any* new European colonial establishments." This was a clear-cut doctrine of the fixity of American boundaries, so far as original settlements were concerned.

In the formal message of December 2, 1823, referring to the dispute with Russia, Monroe said: "In the discussions to which this interest has given rise and in the arrangements by which they may terminate, the occasion has been judged proper for asserting as a principle in which the rights and interests of the United States are involved, that the American continents, by the free and independent condition which they have assumed and maintain, are henceforth not to be considered as subjects for future colonization by any European power." This protest was effectual; and in 1824 and 1825, by separate treaties with the United States and Great Britain, the Russian Government withdrew all its pretentions to territory south of 54° 40′, thus leaving Great Britain the sole competitor of the United States for the ownership of Oregon.

There are some indications that Adams was restive at the

continuance of any European colonies in America; but neither the colonization clause just quoted, nor the other parts of the message, contained any clause concerning Canada and the West Indies. An important territorial inquiry is, therefore, What other parts of America were included in the President's message? Monroe clearly enunciated the doctrine of two spheres: "In the wars of the European powers, in matters relating to themselves, we have never taken any part, nor does it comport with our policy to do so. It is only when our rights are invaded or seriously menaced that we resent injuries or make preparation for our defense. With the movements of this hemisphere we are of necessity more immediately connected, and by causes which must be obvious to all enlightened and impartial observers. The political system of the allied powers is essentially different in this respect from that of America." But he nowhere discriminates between independent American territory and European territory in America, except where he says: "It is impossible that the allied powers should extend their political system to any portion of either continent without endangering our peace and happiness; nor can anyone believe that our Southern brethren, if left to themselves, would adopt it of their own accord." These clauses show that Monroe meant to include Mexico as well as all the South American states in his doctrine; and the phrase "Southern brethren" clearly excludes Canada from the scope of his message.

Territorially, then, Monroe's Doctrine, except for the indirect reference to Europe in the doctrine of two spheres, applies only to the two Americas, or rather to two well-defined areas within the Americas, viz., the Northwest coast, already claimed as a part of the United States; and the two continents south of the United States, embracing the former Spanish and Portuguese colonial empires. Excluded from the immediate doctrine, though doubtless in the back of Adams's mind, were the existing colonies of Great Britain, Russia, France, Holland, and Denmark, the two remaining Spanish islands of Cuba and Porto Rico, and the independent island of San Domingo.

Foremost in the thoughts of both Monroe and Adams, were, of course, those powers which were already recognized, or soon to be recognized, by our government. There were, up to December, 1823, Buenos Ayres, Chile, Colombia, and

Mexico; and in the course of 1824, Guatemala and Brazil, Buenos Ayres and Chile were the earliest countries to achieve complete independence; and there is not the slightest evidence that their distance or their commercial connection with Europe was thought to put them on a different footing from the states farther northward. With the exception of the three Guianas, and of Patagonia, which had never been settled or governed by the Spaniards, the boundary line of the territory covered by the Monroe Doctrine followed the coast from Oregon around South America, and thence along the Gulf to the newly-established delimitation of the United States at the Sabine River.

Another method of making up a map of the regions covered by the Monroe Doctrine is, to notice what powers were included in the Panama Congress, invitations to which were sent out by Bolivar in behalf of the Colombian Republic in December, 1824. Acceptances were received from Mexico, Chile, Peru, Guatemala, and Brazil; of the old Spanish provinces, Buenos Ayres alone held aloof. In President Adams's two messages of December 26, 1825, and March 15, 1826, he discussed the work of the future congress: "An agreement between all of the parties represented at the meeting, that each will guard, by its own means, against the establishment of any future European colony within its borders, may be found advisable. This was, more than two years since, announced by my predecessor to the world as a principle resulting from the emancipation of both the American continents;" and he refers to Monroe's message of 1823 as "A principle in which the rights and interests of the United States were involved, that the American continents by the free and independent condition which they had assumed and maintained, were thenceforward not to be considered as subjects for future colonization by any European power. The principle had first been assumed in the negotiation with Russia. It rested upon a course of reasoning equally simple and conclusive. With the exception of the existing European colonies, . . . the two continents consisted of several sovereign and independent nations, whose territories covered their whole surface."

The principle that the Monroe Doctrine was hostile to the creation of new European colonies out of remnants of the Latin-American empires was cordially conceded by the Latin-American

states. In a letter of the Colombian minister, November 2, 1825, setting forth the objects of the Panama Congress, he included, "The manner in which all colonization of European powers on the American continent shall be resisted, and their interference in the present contest between Spain and her former colonies prevented." The Latin-American states were far from satisfied by Adams's statement to Congress that: "Our views would extend no further than to a mutual pledge of the parties to the compact to maintain the principle in application to its own territory, and to permit no colonial lodgments or establishment of European jurisdiction upon its own soil." The context and the circumstances show that Adams had expected to enter into a binding agreement for the defense of our neighbors against aggression; and that by the resistance of Congress he was compelled to take a less heroic attitude.

In the invitation to the United States appears a guarded reference to the only government which had achieved independence previous to the break-up of the Spanish empire. This was the island of San Domingo, originally all Spanish, then divided with France, then in 1794 all transferred to France, but at once carried out from under French authority by a successful negro insurrection. In the Gaceta de Colombia of February 27, 1825, one of the subjects for discussion in the Congress was declared to be the status of Hayti; and there is a very guarded reference to it in the official invitation to the United States, with the intimation that "this question will be determined at the Isthmus." This seems to be the first entry of this island into the interminable discussions about the Monroe Doctrine.

More immediately significant was the question of Cuba, for Colombia and Mexico were determined to give military aid to the few revolutionists in that island; and the Gaceta de Colombia proposed that the Congress "consider the expediency of combining the forces of the republics, to free the islands of Porto Rico and Cuba from the yoke of Spain." This suggestion raised a new point with regard to the territorial scope of the Monroe Doctrine. Would the United States be a party to any scheme for aiding Cuban independence? Upon this question John Quincy Adams had already expressed himself in a despatch of April 28, 1823, in which he said: "In looking forward to the probable course of events for the short period of half a century, it is scarcely possible

to resist the conviction that the annexation of Cuba to our Federal Republic will be indispensable to the continuance and the integrity of the Union itself." And he further declared that, "The question both of our right and of our power to prevent it [the transfer of Cuba to Great Britain], if necessary by force, already obtrudes itself upon our councils." This despatch, written before Monroe's message, throws a strong light upon the question whether the Monroe Doctrine included the transfer of American colonies from one European power to another. The truth is that Cuba powerfully affected the attitude of the United States on the whole question, and that the theory that the bounds of America were already fixed, so far as related to European possessions, was especially intended to cover Cuba. The despatch again brings out the tacit limitation on the Monroe Doctrine, which allowed the United States to alter those inexorable boundaries to its own advantage. The government exerted its diplomatic influence effectually to prevent any aid to insurrection in Cuba, and thereby probably perpetuated Spanish rule in that island for more than seventy years.

This review of the evidence as to the territorial meaning of the original Monroe Doctrine shows clearly that it covered all the continental independent states of the two Americas; that it was not directed against Russian America, British America, the various West Indian possessions, or the three European colonies on the north coast of South America; that Hayti was left out of account for the time, probably because it had proved such an impossible nut to crack that no European power coveted it. As for Cuba, the United States was content that it should remain Spanish till the pear was ready to drop into the hands of the waiting neighbor.

III. Period of Quiescence (1826-1843).

However clear Monroe's understanding of his Doctrine, it was impossible for him to lay down limitations which would bind all his successors; as time went on, new territorial complications arose in America, and other statesmen gave it new expression or applied it differently. From 1826 to 1843 few questions arose calling for an assertion of the Doctrine, except several intimations that Cuba in no circumstances must pass to another European power. Spain still farther lost prestige and in 1836 began reluc-

tantly to acknowledge the independence of her former subjects on the continent, retaining Cuba by the good will of the United States. France, which in the twenties cherished ambitious schemes of endowing younger branches of the royal house with American kingdoms, and in 1825 undoubtedly had designs upon Cuba, turned toward North Africa for a field of colonization. Great Britain alone of the European powers cherished her interests in America. During the period from 1826 to 1843, some difficulties occurred between the Latin-American powers on one side and the United States or European powers on the other. In 1829 the Falkland Islands, which were claimed by Great Britain, were seized by Buenos Ayres on the ground that the latter power succeeded to a shadowy Spanish title. Notwithstanding an appeal by the Argentine Republic to the Monroe Doctrine, the United States sent a ship of war which carried away the Argentine governor. Again, in 1838 over a dispute with regard to Uruguay, France and Great Britain blockaded the coast of the Argentine to prevent the annexation by that power of the disputed territory; and the United States made no protest.

Long before 1843, it was discovered that the Latin-American neighbors had not justified the expectations indulged in when they were first founded. In most of them, a series of revolutions broke up their prosperity, and led to causeless difficulties and wars among themselves, and to destruction of the life and property of foreigners. This state of things brought out the first suggestion that the United States must compel its neighbors to live up to their international duties. As early as 1831, Jackson suggested war against Mexico because of the neglect to settle the claims of the United States; and a crop of difficulties was springing up in other parts of America. At the same time the United States was pushing against the territory of its own continental Latin-American neighbor, Mexico. Evidently new forces were beginning to tell in American affairs.

IV. The Monroe Doctrine and Annexations (1844-1860).

Annexation of American territory was no part of Monroe's Doctrine, except as Oregon came under the principle of no further European occupation of wild territory. But John Quincy Adams, who negotiated the annexation of Florida in 1819, who tried to purchase Texas in 1825, and who predicted the eventual annex-

ation of Cuba, must be supposed to have seen in the Monroe Doctrine no bar to the enlargement of American territory. His successor in the presidency, Jackson, did his utmost for the immediate annexation of Texas, which in 1836 withdrew itself from Mexico, and of course as an independent American state was entitled to the application of the Monroe Doctrine. It is interesting to note that President Tyler, December 3, 1844, urged that the protests of Mexico against the annexation of Texas, be disregarded, because "Such a condition of things would not be tolerated on the European continent." Texas was duly annexed, through a policy inaugurated by Tyler and consummated March 3, 1845; the next day a new elemental force in American territorial affairs made its appearance in President James K. Polk.

Few presidents of the United States have had the vigor of Polk; not one has been so successful in carrying out his plans. Five great territorial questions confronted him when he took office,—Texas, Oregon, California, the Isthmus, and Cuba; in four of the five directions, he accomplished what he set out to do. In every one of these five questions, the only European power which was really involved was Great Britain. Still the first naval power of the world, still planting colonies all over the world, still the possessor of Canada and many West Indian islands, still interested in Texas and Cuba, still claiming Oregon north of the Columbia, and perhaps coveting California, still planted in British Honduras, which flanked the Nicaragua route to the Pacific Ocean, Great Britain by this time was the sole representative in America of the "European political system," which so disturbed Monroe.

Polk at once began to turn over in his mind the means of extending the territory and influence of the United States. November 8, 1845, in his instructions to Slidell for his mission to Mexico he alluded to the Monroe Doctrine. In his first annual message, December 2, 1845, he approved and defended the annexation of Texas, which had by that time gone through its formal stages; and he sounded a clarion note with regard to Oregon. His point of departure is the doctrine of two spheres, inasmuch, he says, as the United States has not interfered in Europe, "We may claim on this continent a like exemption from European interference"; and he protests against a supposed purposed to establish a "balance of power on this continent." After quoting the colonization clause from Monroe's message, he

adds: "This principle will apply with greatly increased force, should any European power attempt to establish any new colony in North America. In the existing circumstances of the world, the present is deemed a proper occasion to reiterate and reaffirm the principle avowed by Mr. Monroe, and to state my cordial concurrence in its wisdom and sound policy. The reassertion of this principle, especially in reference to North America, is at this day, but the promulgation of a policy which no European powers should cherish the disposition to resist."

Polk himself explained to Benton that in this message he had "California and the fine bay of San Francisco as much in view as Oregon." So far as it was a threat to Great Britain it probably had some effect; in 1846 that power agreed to a reasonable territorial compromise on the line of 49 degrees. So far as it states a general principle, it puts two intentional limitations on the territorial reach of the Monroe Doctrine: Polk says that no American state, under the Monroe Doctrine, can voluntarily transfer itself to a European power; and, for the first time, an effort is made to restrict the Doctrine to North America. John Quincy Adams expressed his hearty approval of the principle of the message of 1845, but repeated his understanding "That the continents of North and South America were no longer to be considered as scenes for their future European colonization."

Doubtless the reason for Polk's insistence on a stricter doctrine was our heavy responsibilities on the Pacific coast of North America, due to the recent settlement of the Oregon question and annexation of California; but North America, politically, did not include the Isthmus of Panama, inasmuch as that narrow land was a part of the old viceroyalty of New Granada, and of the republic of Colombia or New Granada, which succeeded to its territory.

In 1846, New Granada, fearing undue pressure by Great Britain, initiated a treaty, by which New Granada guaranteed the use of any inter-ocean transit across the Isthmus of Panama to the United States; and in return "The United States guarantee, positively and efficaciously, to New Granada, by the present stipulation, the perfect neutrality of the before-mentioned isthmus, with the view that the free transit from the one to the other sea, may not be interrupted or embarrassed in any future time while this

treaty exists; and, in consequence, the United States also guarantee, in the same manner, the rights of sovereignty and property which New Granada has and possesses over the said territory."

This is the first of the great treaties relating to an Isthmus canal, yet Polk very reluctantly accepted it, fearing lest it be considered one of those "entangling alliances," to avoid which "has become a maxim of our policy consecrated by the most venerated names which adorn our history and sanctioned by the unanimous voice of the American people." Nevertheless he urged and secured its ratification, on the ground that it was expected that similar guarantees would be given by Great Britain and France. Nothing can be clearer than that, when the Isthmus question first became serious, the United States laid no claim to an interest different from or superior to that of European powers; and the equal use, and the neutrality of the canal were accepted by Polk, the special champion of the Monroe Doctrine.

Polk did not again allude officially to the Monroe Doctrine till a message of April 29, 1848, when some representatives of Yucatan, who were in revolt against Mexico, proposed annexation to the United States. Polk quotes a passage from Monroe's message and adds: "Our own security requires that the established policy thus announced shall guide our conduct, and this applies with great force to the peninsula of Yucatan. It is situated in the Gulf of Mexico, on the North American continent, and, from its vicinity to Cuba, to the capes of Florida, to New Orleans, and, indeed to our whole southwestern coast, it would be dangerous to our peace and security if it should become a colony of any European nation."

Almost the only setback which Polk experienced in his diplomacy was his effort to annex Cuba. A time had come when the United States wished to put an end to the Spanish dominion in that island; and in 1848 Polk made an unsuccessful attempt to buy the island from Spain.

Before Polk was out of office, a controversy arose which his successor, Taylor, had to adjust, nominally as to certain British claims to the Mosquito territory near the Nicaragua canal route, actually over the rival interests of the two powers in America. This serious difficulty was partially adjusted by the Clayton-Bulwer treaty of 1850, which was substantially an admission by the United States that Great Britain had an equal interest in a

future Nicaragua canal; and further that the principle of neutrality and common use by all nations extended to any Isthmus route. Unfortunately the treaty was ambiguous with regard to the continuance of the British colony of Belize and its outliers, the Bay Islands and the Mosquito coast. The United States insisted that the treaty precluded any British colonies in Central America; the British took the ground that the inhibition applied only to future territorial establishments. After ten years of discussion, Great Britain withdrew from the Mosquito coast, and the United States accepted the continued existence of the colony of Belize.

With the exception of a movement for a premature recognition of Hungary in 1849, which threatened the doctrine of two spheres, and the unsuccessful efforts of England and France to secure from the United States in 1852 a mutual agreement not to annex Cuba, the Monroe Doctrine was little invoked between 1850 and 1857. January 4, 1853, Lewis Cass, then senator from Michigan, laid down his understanding of the Doctrine to be that "No future European colony or dominion shall, with their consent, be planted or established on any part of the North American continent," which was a sort of re-affirmation of Polk's doctrine. In a speech of January 28, 1856, Cass insisted that the Doctrine obliged the United States by force to resist the establishment of any European dominion in North America. As Secretary of State, September 8, 1860, Cass had the opportunity in a despatch to our Mexican minister to pronounce against the European possession of any American territory.

Up to this time there had been several cases of punitive expeditions by European powers against Latin-American powers—for instance, in 1856, a naval demonstration was made by the United States on both sides of the Isthmus of Panama to protest against a tonnage tax laid by Colombia. In his annual message of December, 1859, Buchanan went still farther by protesting against a proposed joint European expedition into Mexico for the purpose of securing indemnity and collecting bonds because of "Our established policy which is inconsistent with the intervention of any European power in the domestic concerns of that Republic." This Doctrine as to collection of debts was, however, laid aside, and did not come into prominence again until after 1895.

V. THE MONROE DOCTRINE AND THE ISTHMUS CANAL (1861-1875).

In 1861, nearly forty years had passed since the enunciation of a new American doctrine by Monroe; and during that time there had been no practical development of the Doctrine; no warning had been served or needed to be served on foreign countries for the protection of independent American states; and the questions of occupancy of the Pacific coast were all settled. Polk had rather weakened than strengthened the Doctrine, by his suggestion of limiting it to North America, which was taken up by nobody except Cass; and in the critical question of the Isthmus, both Polk and Clayton deliberately accepted joint interest with Great Britain. In discussing that question, Cass said: "One motive with some of us—perhaps with many of us—in the Senate for supporting the Clayton-Bulwer treaty, was that, if carried out in good faith, it would peaceably do the work of the Monroe Doctrine, and free an important portion of our continent from European interference."

The first and the only indisputable test of the original Monroe Doctrine came in 1861, as a result of a joint expedition of England, France, and Spain into Mexico, against which Buchanan protested and which Lincoln vainly sought to avert by the United States advancing money to settle the claims of the offended powers. This expedition soon proved to be a territorial enterprise of France; the other two powers withdrew; and as the United States had its hands full with its Civil War, the French overthrew the native Mexican government and in 1864 set up the so-called independent empire of Maximilian. The scheme was one to disturb the boundaries of America, to overwhelm an American state, to introduce a new European colony, and to extend a despotic monarchical power to America; the Monroe Doctrine, the Polk Doctrine, national interest, and common sense were all against it. Secretary Seward, however, in a series of remonstrances which grew stronger until, in 1867, they were peremptory, never once referred to the "Monroe Doctrine"; he insisted steadily upon the less extensive principle that the Mexicans had a right to choose a government for themselves; but that the United States would neither recognize nor permit the establishment of a foreign dependency by military force, against the will of the Mexicans.

Perhaps Seward thought that a Seward Doctrine was good

enough for the exigency. At any rate, in 1864, he began to assert in a series of treaties and negotiations with Honduras, Nicaragua, and Colombia, the principle that the Isthmus Canal was an American concern, in which Great Britain had no rights or special interest other than those possessed by all the European powers. This doctrine of a larger influence of the United States in America, Seward enforced by the annexation of Alaska, thus at last excluding Russia, a European power, from America; and by the attempt to annex the Danish West India Islands and San Domingo. He earlier lodged a protest against the attempt of the Spaniards, in 1862, to recover possession of San Domingo, a protest which the people of that island made unnecessary by their resistance.

December 9, 1868, toward the end of Seward's régime, but probably without his approval, President Johnson went to the length of urging that, "Comprehensive national policy would seem to sanction the acquisition and incorporation into our Federal Union of the several adjacent continental and insular communities as speedily as it can be done peacefully, lawfully, and without any violation of national justice, faith, or honor. Foreign possession or control of those communities has hitherto hindered the growth and impaired the influence of the United States." Since Johnson could scarcely have had Mexico in mind, he doubtless was looking toward Canada and the West Indies; indeed, from this time until 1871, it seemed probable that Canada, with its own consent and that of Great Britain, would be annexed to the United States.

This territorial change was probably prevented by the creation of the Dominion of Canada, which caused a vote of the House of Representatives, March 7, 1867, to the effect, "That a confederation of States on this continent, extending from ocean to ocean, established without consulting the people of the Provinces to be united, and founded on monarchical principles, cannot be considered otherwise than in contravention of the traditional and constantly-declared principles of this Government."

Though the annexation of Canada ceased to be urged, President Grant, and his able secretary, Hamilton Fish, had far-reaching plans of enlarging the influence and territory of the United States. In his first annual message, December 6, 1869, Grant says, in discussing European possessions in America, especially Cuba:

"These dependencies are no longer regarded as subject to transfer from one European power to another. When the present relation of colonies ceases, they are to become independent powers, exercising the right of choice and of self-control in the determination of their future conditions and relations with other powers." In a special message of May 31, 1870, urging the annexation of San Domingo, Grant again declared that: "The doctrine promulgated by President Monroe has been adhered to by all political parties, and I now deem it proper to assert the equally important principle that hereafter no territory on this continent shall be regarded as subject of transfer to a European power. . . . . The acquisition of San Domingo is an adherence to the 'Monroe doctrine.'"

A few days later, June 13, 1870, the President a third time called attention to Monroe's policy toward the revolts in the Spanish provinces, which policy, he declared, "Has secured to this Government the confidence of the feeble powers on this continent, which induces them to rely upon its friendship and absence of designs of conquest and to look to the United States for example and moral protection. It has given to this Government a position of prominence and of influence which it should not abdicate, but which imposes upon it the most delicate duties of right and of honor regarding American questions, whether those questions affect emancipated colonies or colonies still subject to European dominion."

This message was undoubtedly suggested by Secretary Fish, for on July 14, 1870, in reply to a request to investigate the question why the United States had so little of the Latin-American trade, he sent in a report, immediately made public, in which reappeared our good old friends "recognition," "entangling alliances," and the "Holy Alliance." Fish quotes Grant's message of December, 1869, and enlarges its principles, by asserting that, "This policy . . . . opposes the creation of European dominion on American soil, or its transfer to other European powers, and it looks hopefully to the time when, by the voluntary departure of European government from this continent and the adjacent islands, America shall be wholly American." This amplified Monroe Doctrine, Fish applies to the specific case of Cuba and also to the Isthmus Canal, declaring that the treaty of 1846 with Honduras, and of 1867 with Nicaragua "constitute *pro*

tanto a true protective alliance between the United States and each of those Republics."

In still another direction President Grant and Secretary Fish pushed the doctrine and enlarged its territorial scope. In his message of December 5, 1870, Grant insisted that San Domingo must be annexed to the United States because "The acquisition of San Domingo is an adherence to the 'Monroe doctrine'; it is a measure of national protection; it is asserting our just claim to a controlling influence over the great commercial traffic soon to flow from west to east by way of the Isthmus of Darien. . . . . The time is not probably far distant when, in the natural course of events, the European political connection with this continent will cease." In a special message, April 5, 1871, he said: "We should not permit any independent government within the limits of North America to pass from a condition of independence to one of ownership or protection under a European power. . . . . In view of the facts which had been laid before me, and with an earnest desire to maintain the 'Monroe doctrine,' I believed that I would be derelict in my duty if I did not take measures to ascertain the exact wish of the Government and inhabitants of the Republic of San Domingo in regard to annexation, and communicate the information to the people of the United States."

As thus presented by President Grant, whose messages were probably phrased by Fish, the Monroe Doctrine included not only all the independent fragments of the former continental Spanish and Portuguese empires, but also Cuba, the isthmus route, San Domingo, and the existing European colonies.

> "All the Germans but Hermann,
> And Hermann's a German."

Yet, notwithstanding the breadth of what might be called the Fish Doctrine, no part of it was actually applied during Grant's administration.

As to Cuba, Fish, in 1875, took the unprecedented step (absolutely opposed to the spirit of the Monroe Doctrine) of asking the European powers to unite with the United States in effectual intervention to stop the war then going on in that island; and in 1878, to obviate such interference, Spain made terms with the insurgents, and thus put an end to the crisis. As to San Domingo, even the personal popularity of the President could not convince public sentiment, and his treaties were rejected by the Senate. The whole isthmus question went over to the next administration.

VI. DOCTRINE OF PARAMOUNT INTEREST (1879-1895).

The truth is that in the seventies the Monroe Doctrine was unnecessary. The prestige of the United States was greatly increased by the reunion of the country after the Civil War; old boundary disputes had been mostly adjusted; and, except for the Cuban war, there was neither danger nor disturbance in the West Indies. The status of the Americas was again brought in question, in 1879, by the inauguration of a canal across the Isthmus of Panama, by a French company. For protection against the causeless aggression or territorial greed of European powers the Isthmus of Panama, as a part of Colombia, was undoubtedly included in the principles of the Monroe Doctrine; and by the New Granada treaty of 1846 and the Clayton-Bulwer treaty of 1850 the United States had secured equal privileges in any canal that might be constructed on any route. But Fish desired to acquire for the United States a status superior to that of any other country, and in a despatch of April 26, 1873, to our minister in London, he instructed him to remonstrate against supposed aggressions of Great Britain in Guatemala. Like Seward, Fish negotiated a treaty with Colombia which, rather in derogation of the Clayton-Bulwer treaty, would have given the United States such a privileged status as Fish desired; but both treaties contemplated such extensive rights of intervention that the Colombians drew back in affright and would not ratify them.

Some point was given to Fish's anxiety by the effort to construct a canal, the ownership of which would be vested chiefly in subjects of France, who would be entitled to the protection of their own government for their canal. Hence a protest was framed by Secretary Evarts, March 8, 1880, in which he declared that, "The paramount interest of the United States in these projects of interoceanic communication across the American Isthmus has seemed quite as indisputable to the European powers as to the States of this continent. . . . . Accordingly they have shown no disposition to take part in any political arrangements of this American question, except in accord with the United States, and upon an evident desire of this Government that they should do so. . . . . The United States, therefore, as the great commercial and political power of America, becomes, necessarily, a principal party." In a message of the same date President Hayes said: "An interoceanic canal across the American Isthmus will essen-

tially change the geographical relations between the Atlantic and Pacific coasts of the United States, and between the United States and the rest of the world. It will be the great ocean thoroughfare between our Atlantic and our Pacific shores, and virtually a part of the coast line of the United States."

The phrases "paramount interest" and "a part of the coast line of the United States" were arguments to conjure with; but it was difficult to arouse the American people to a sense of danger to their prestige simply because French capitalists were willing to risk their money on a doubtful enterprise; the country was willing to meet the question of eventual control when it came. The spirit of opposition to the Panama Canal took the form of a rival American enterprise to construct a canal across the Nicaragua route, which secured American charters, vainly applied to Congress for financial aid and waited in the hope of eventually being bought out by the government.

Yet at the other end of the world, just at this juncture, a great territorial change occurred, the effects of which nobody in the United States then seemed to perceive; but it made certain the eventual control of the American canal by the United States. This was the occupation of Egypt, in 1881, by Great Britain, which by purchase of private French holdings was already owner of a majority of the Suez Canal stock. Although a convention was negotiated for the common use of that canal even in time of war, it remained for years inoperative; the canal was both owned and managed by the British government; and from that moment the Clayton-Bulwer treaty was doomed, for it was unreasonable that any nation should control one of the two great artificial arteries of world commerce, and at the same time retain at least a half interest in the other. In the long run Suez made impossible English influence over Panama.

While the French were throwing their money away in the Isthmus, the Pan-American activities of the United States took a different turn under the superintendence of Secretary Blaine in 1881. On the Isthmus question both he and Secretary Frelinghuysen ran against a stone wall in their efforts to first ignore and then to explain away the Clayton-Bulwer treaty; but as to our general relations with Latin-American powers Blaine had several sagacious and far-reaching ideas. He wanted to stimulate South American trade by the only possible method, viz., by reciprocity

treaties, an idea in which President Arthur supported him, but not the Senate. He issued invitations for a congress of American powers, which went over because of his retirement in 1881. Above all, he wanted to exert his influence and the influence of his country against the causeless and destructive wars among the Latin-American countries.

When Blaine came into the Department of State, in March, 1881, he found one of those wars going on between Chile and Peru and gave instructions, June 15, to our ministers to those countries that "the Government of Peru may fairly claim the opportunity to make propositions of indemnity and guarantee before submitting to a cession of territory." His too-zealous subordinates put a peremptory tone upon this suggestion which was very unwelcome to Mr. Blaine; thus General Hurlbut said, "While the United States recognize all the rights which a conqueror gains under the laws of civilized war, they do not approve of war for the purpose of territorial aggrandizement, nor of the violent dismemberment of a nation." This interference, which appears to have sprung from a genuine interest in the welfare of Latin-America, was ignored by Chile and left a disagreeable impression among the American states. It also sharpened the temper of Secretary Blaine's successor, Frelinghuysen, who on January 4, 1883, *apropos* of a proposal that one of the recurring disputes of the European powers with Hayti should be arbitrated, wrote; "The Department of State will not sanction an arbitration by European states in South-American difficulties, even with the consent of the parties."

When Mr. Blaine returned to the State Department under President Harrison in 1889, he at once revived his scheme for a Pan-American conference which met at Washington in 1889-1890. The conference drew up a variety of useful bases for common commercial practices and instrumentalities, such as an inter-American bank and an inter-continental railway; but though nearly all the American powers sent representatives, none showed any disposition to be guided by the United States for their own good.

In another territorial question Mr. Blaine showed a disposition to push very far the territorial claims of the United States; he revived for the protection of the seals that resorted to the Alaskan Islands those pretentions to a closed sea jurisdiction against which

John Quincy Adams had protested in 1822, and which constituted one of the grounds for the Monroe Doctrine.

This period ends with an interesting territorial change in South America; after seventy-two years of existence as a monarchy, Brazil was in 1889 transformed into a Federal republic, thus removing the last nominal monarchy of independent America. As a matter of fact this change, which involved a decided weakening of the power of Brazil, was much less significant than the strengthening of three other Latin-American states. The Argentine Republic, earlier called Buenos Ayres, began to develop its enormous resources of rich soil and to attract immigration from Europe. In Chile in 1890 an attempt of the outgoing President Balmaceda to make himself a dictator was successfully resisted and the oligarchic republic was saved. In Mexico, after fifty years of distraction, good order was at last brought about under the beneficent despotism of President Diaz. It is customary to point to this improvement in the status of Mexico as a proof of the capacity of Latin-Americans for self-government; there is, however, no more self-government in Mexico then in Venezuela. Railroads have been constructed there, principally by American capital, which make it possible for the central government to transport troops and thereby to prevent the growth of insurrections; on the other side, the railroad owners and other foreign investors insist on protection to their own property. Order is thus maintained, but there is no more progress in the development of an enlightened public sentiment in Mexico which shall be effectual in matters political, than in other parts of Latin-America; and the heavy financial interest of America, so far forth, makes Mexico a commercial protectorate of the United States.

VII. Fiat of the United States (1895-1899).

When Mr. Cleveland became President he took early occasion to say, December, 1885: "I do not favor a policy of acquisition of new and distant territory or the incorporation of remote interests with our own. . . . . Therefore I am unable to recommend propositions involving paramount privileges of ownership or right outside of our own territory. . . . . Whatever highway may be constructed across the barrier dividing the two greatest maritime areas must be for the world's benefit—a trust for mankind, to be removed from the chance of domination by any single

power." It was therefore like lightning from a clear sky when, December 17, 1895, in his second term, President Cleveland sent to Congress a special message upon the refusal of Great Britain to arbitrate a disputed boundary with Venezuela, ending with the belligerent clause: "I am fully alive to the responsibility incurred and keenly realize all the consequences that may follow."

This message was in support of a despatch of Secretary Olney to Lord Salisbury, dated July 20, 1895, in which the Secretary propounded a Monroe Doctrine of his own, more sweeping even than that of Mr. Fish and studded with highly undiplomatic phrases. The ground of Olney's argument was that, by the refusal to arbitrate upon a tract of territory claimed by British Guiana, Great Britain was affecting the destinies of Venezuela, extending the area of the British Empire with its monarchical principles, and colliding with the Monroe Doctrine, of which Olney quoted considerable parts and which he summed up as establishing "That no European power or combination of European powers shall forcibly deprive an American state of the right and power of self-government and of shaping for itself its own political fortunes and destinies." The Monroe Doctrine he further declared to be "The accepted public law of this country. . . . . The Venezuelan boundary controversy is in any view far within the scope and spirit of the rule as uniformly accepted and acted upon. . . . . That distance and 3000 miles of intervening ocean make any permanent political union between an European and an American state unnatural and inexpedient will hardly be denied. . . . . To-day the United States is practically sovereign on this continent, and its fiat is law upon the subjects to which it confines its interposition."

Just why this remarkable dispatch, so out of keeping with President Cleveland's usual calm, so bristling with defiance to Great Britain, so belligerent toward Canada and the British West Indies, should have been sent, with the President's approbation, has never been satisfactorily explained. Some years later, Mr. Cleveland, in a magazine article, came no nearer revealing the ultimate workings of his mind than the vague phrases: "It was necessary in order to assert and vindicate a principle distinctly American . . . . our government interposed to prevent any further colonization of American soil by a European nation. . . . . We needed proof of the limits of her rights in

order to determine our duty in defense of the Monroe Doctrine." Mr. Olney later seemed to realize that he had uncorked a *genii*, which he was unable to return to the bottle in which King Solomon had once sealed him up. In accordance with the suggestion of the President, an *ex parte* commission was appointed to examine the evidence; but long before it could report, Great Britain gave way, submitted to the desired arbitration, and practically accepted the American government as counsel for Venezuela.

Although almost the whole of the disputed territory was, by the resulting arbitration, assigned to Great Britain, the incident marked a new dispensation in American affairs. It was easy for Lord Salisbury to confute the history and the public law of Mr. Olney, but impossible for him to ignore the fact that the great majority of the American people, perhaps unreasonably, approved the message and the despatch. For the first time, the British public awoke to the fact that they must forfeit either the friendship of the United States or their ancient status as one of the two great American powers.

The result was a complete *volte-face* by the British government, the first effect of which was the warm friendship and diplomatic support of Great Britain during the Spanish war, which broke out in 1898; and the cordial acquiescence of that power in the annexation of the Philippine Islands and Guam by conquest in the Pacific, the annexation of Porto Rico as another of the fruits of conquest, the annexation of the Hawaiian Islands, with the consent of the Hawaiians, and the establishment of a protectorate in Cuba. A confused notion that the Monroe Doctrine was somehow involved, is seen in a passage in a report made to the Senate in 1890: "We cannot consent upon any condition that the depopulated portions of Cuba shall be re-colonized by Spain, no more than she should be allowed to found a new colony in any part of the hemisphere or islands thereof." At the end of the war, the United States, recognized as a Central Pacific power, an Asiatic power, and a West Indian power, entered on a new period of American diplomacy, in which the Monroe Doctrine underwent many alterations in spirit and some in territorial application.

VIII. THE UNITED STATES AND THE BIG STICK (1900-1906).

Territorially, the readjustment brought about by the Spanish war profoundly altered the status of America and the application of the Monroe Doctrine; Cuba and Porto Rico were removed from its further protection; a new activity in American affairs was shown by a Pan-American Congress in 1902, and Mr. Root's South American mission in 1906; the entry of the United States among world powers broke down forever the doctrine of the two spheres; the Isthmus question went forward to a swift solution, leaving the United States master of the whole situation; an effort by Germany to drive the wedge of colonization in South America was repelled; the question of interference for the collection of debts came up in a new form; and President Roosevelt in repeated messages re-defined and expounded the Monroe Doctrine.

By a solemn act at the beginning of the Spanish war, Congress disavowed any purpose of annexing Cuba; but though the island became nominally independent, it agreed to a set of fundamental conditions which make it practically an American protectorate, and therefore entirely withdrawn from any chance of foreign aggression. As President Roosevelt said in his messages of 1902 and 1905, with reference to Cuba and San Domingo: "In a sense Cuba has become part of our international political system." "Under the proposed treaty the independence of the island is scrupulously respected, the danger of violation of the Monroe Doctrine by intervention of foreign powers vanishes, and the interference of our Government is minimized." The annexation of Porto Rico also removed that island from the purview of the Doctrine. Steps, for the time unsuccessful, were taken to annex the Danish West Indies by treaty with Denmark, but the effort failed, as it had failed in 1867.

A new feeling of interest in Latin-America was shown by attempts to stimulate inter-American trade, especially by a ship subsidy; and the correspondingly successful effort to prevent the development of that trade by smothering the reciprocity treaties in the Senate. The second Pan-American Congress assembled on the invitation of the United States at the city of Mexico in 1902, and in practical matters went much farther than that of twelve years earlier, by drawing up a general scheme for arbitration between American states, and by formally approving the construction of the Panama Canal by the United States gov-

ernment. The Latin-American states have always been willing that somebody else should protect them from European aggression, as was shown, in 1896, by President Diaz of Mexico, who said: "Each one of these republics ought by means of a declaration like that of President Monroe, to proclaim that every attack on the part of a foreign power, with the view of curtailing the territory or independence of, or of altering the institutions of any one of the republics of America, would be considered by the nation making the declaration, as an attack on itself." In 1906, Secretary Root made an official progress through South America for the purpose of reassuring those states as to the attitude and purpose of the United States toward its neighbors. And in the third Pan-American conference at Rio, the Latin-American powers sought to lay down the Drago Doctrine, that debts and contract obligations should not be enforceable by military duress.

Perhaps the most striking result of the Spanish war was the blowing into fragments of the cherished doctrine of the two spheres. Up to 1895, the United States almost always refrained from so much as showing interest in European affairs; Monroe, who warmly sympathized with the Greek Revolution of 1823, hardly allowed himself to express sympathy; but in 1902 Mr. Hay made a pointed protest against the treatment of Jews in Roumania; and in his message of 1904, the President of the United States expressed the National "horror on an occasion like that of the massacre of the Jews in Kishenef, or when it witnesses such systematic and long-extended cruelty and oppression as the cruelty and oppression of which the Armenians have been the victims."

The old doctrine of isolation was already weakened and it was destroyed by the annexation of the Philippine Islands, which brought the United States into close physical relation to Asia, and into the midst of a contest of the European powers for Chinese territory. Asiatic countries have become European countries; as an Asiatic power the United States must take cognizance of European combinations and policies. There was even, towards the end of the Spanish war, a hint of sending a fleet to harry the Spanish coast. Having therefore forsaken its policy of non-interference with European affairs, the United States can no longer found its American policies, as Monroe, John Quincy Adams, Polk, Seward, Fish, and Olney did, upon the doctrine of two spheres.

So far from abandoning the Monroe Doctrine, however, President Roosevelt and his co-adjutors, Secretary Hay and Secretary Root, have fortified and amplified the Doctrine upon the simpler ground of paramount interest. This was shown first of all in the new relations to the Isthmus. The first object was to procure from Great Britain a withdrawal of the principle of joint interest in the canal, which was embodied in the Clayton-Bulwer treaty; after one failure in 1901, a new treaty was in 1902 successfully negotiated by Mr. Hay, in which Great Britain admitted the right of the United States singly to go forward with the construction of a canal. So far as that world's highway is concerned, Great Britain thereby abdicated as an American power. The United States went back to a doctrine originally laid down by Secretary Cass in 1858: "Sovereignty has its duties as well as its rights, and none of these local governments, even if administered with more regard to the just demands of other nations than they have been, would be permitted in a spirit of eastern isolation to close the gates of intercourse on the great highways of the world, and justify the act by the pretension that these avenues of trade and travel belong to them, and that they choose to shut them, or, what is almost equivalent, to encumber them with such unjust relations as would prevent their general use."

However, when a United States commission of experts reported in 1900 that the Isthmus of Panama furnished the best route, provided the property and franchises of the French company could be acquired on moderate terms, Congress authorized the President to make an agreement with the United States of Colombia, by which the transfer should be accomplished. The treaty was duly negotiated; but an unexpected eruption of public opinion in Colombia, practically influenced by a purpose to confiscate the French company's property on a technicality, prevented its ratification.

The people dwelling on the Isthmus then revolted from Colombia; were immediately recognized by the United States as independent; and forthwith practically abdicated that independence by a treaty, under which the United States is now constructing the long delayed canal, and is taking the sole responsibility for the maintenance of order and the equal use of the waterway in time of peace. Thus, after more than fifty years of agitation, the United States has asserted a doctrine, not contained in or contemplated by the original Monroe Doctrine, to the effect that

it has a paramount interest in the canal, and may own it, operate and control it; hence the canal strip, and to a considerable distance the approaches in both directions are no longer capable of interference by any foreign powers, without exciting the immediate hostility of the United States. As President Roosevelt put it in his message of 1905: "That our rights and interests are deeply concerned in the maintenance of the Doctrine is so clear as hardly to need argument. This is especially true in view of the construction of the Panama Canal. As a mere matter of self-defense we must exercise a close watch over the approach to this canal; and this means that we must be thoroughly alive to our interests in the Caribbean Sea."

The American situation after the Spanish war was much disturbed by the appearance in the world of a new European naval colonizing power; this was Germany, which has furnished millions of emigrants to other parts of the world, but until 1884 had no colonies. Then desperate efforts were made to secure parts of Africa; and in the confusion resulting from the Chinese and Japanese war of 1895, the Germans also seized a little piece of China. They undoubtedly had their eyes upon the Philippine Islands, before and at the time of their annexation to the United States. This powerful, enlightened, highly commercial nation, Germany, with an excess of intelligent population, is in many ways well fitted to take part in the development of wild countries; but she came too late into the scramble; the parts of Africa which she was able to procure are of little value; and in Asia people must reckon with the new power of Japan and the mighty but unorganized potentialities of China.

South America, with its enormous, rich, and productive territories, little developed, and ruled by weak, despotic and beligerent governments, seemed a possible field for German colonization, especially in view of the fact that there are scores of thousands of German citizens in Brazil; the one physical obstacle was the attitude of the United States. Prince Bismarck once called the Monroe Doctrine "an American impertinence;" Professor Adolph Wagner spoke of it as an "empty pretension." Was it not possible to be rid of its restrictions? In 1903, the German Emperor seemed to have formed one of those projects thrown off by his active mind for coming to an understanding with the United States, by which Germany should become a second recognized American power, sharing with our government the responsibility

for maintaining the Monroe Doctrine against the rest of the world. This alluring idea was rejected by President Roosevelt; and when, in the next year, the Germans desired to make a military demonstration against Venezuela, the consent of the United States was asked in advance, and the Germans filed a formal statement that they had no purpose of annexation. Behind this document lies a piece of unwritten history. It is clear that a distinct and positive understanding was reached between President Roosevelt and the German Emperor, and that the United States once for all declined to divide its authority and responsibility in America with Germany, or any other European power.

Although this serious complication was avoided, one of the most difficult problems that has ever arisen in connection with the Monroe Doctrine remained for settlement; and that was the attitude of the United States toward the use of force by foreign countries for the collection of claims against Latin-American states. From the foundation of those countries, such claims have been made by the citizens of foreign powers, residing and traveling in the Latin-American countries. The usual principle among civilized nations is one to which the representatives of all the Latin-American countries in the Pan-American Congress of 1890 gave their formal adhesion, namely, that the foreigner should have the same status, the same protection for life and property and the same legal remedy as the native, and no other. The representative of the United States at that Congress pointed out that such a principle would justify forced loans and the seizure of private property, as well as the repudiation of public debts. The essential difficulty here is the attempt, to use the philosopher's phrase, "to reconcile being and not being." The Monroe Doctrine rests on the idea that the Latin-American states are independent powers by the inherent right of nations, free from foreign interference; on the other hand, the United States and foreign powers alike have always treated these nations as incomplete members of the family of nations. For instance, the claim of foreign ministers to harbor political refugees in the legations is incompatible with sovereignty. Our frequently brusque and summary diplomatic attitude is illustrated by the correspondence between the United States and Chile in 1891. Punitive expeditions such as that of the United States against Brazil, in 1857, are evidences that the actual treatment of Latin-American states is not unlike

that of such Asiatic powers as Siam, and such European powers as Bulgaria.

To be sure, President Roosevelt, in his message of 1905, makes a distinction between American states: "There are certain republics to the south of us which have already reached such a point of stability, order, and prosperity that they themselves, though as yet hardly consciously, are among the guarantors of this Doctrine. . . . . If all the republics to the south of us will only grow as those to which I allude have already grown, all need for us to be the especial champions of the Doctrine will disappear, for no stable and growing American Republic wishes to see some great non-American military power acquire territory in its neighborhood."

Admitting the fact that the Monroe Doctrine especially applies to imperfect states, several other difficulties arise. The first is a necessary distinction between contract obligation and obligations arising under general principles of international law. If the capitalist lends money to a Latin-American country, does he take his own risk of repayment, or is he entitled to the diplomatic and, if necessary the military, support, of his own country, in case the bonds are repudiated or ignored?

The United States, ten of whose commonwealths have, at one time or another, absolutely repudiated their bonds, is not in a position to support the doctrine that national debts can be collected by force. The injuries to life and property caused by civil commotion or by official acts of *de facto* governments, stand on a different footing, for every government is bound to protect the resident citizen of its neighbors in their peaceful avocations. But the Latin-American governments have shown themselves incapable of protecting their own people, and feel it a cruel hardship that the foreigner should be put in a better position than the native.

Partly for this reason, and partly from the chronic lack of funds to pay claims, it is the practice of those governments to postpone settlements, and to let claims roll up until some exasperated power takes matters in its own hands. For this disturbed condition of the Latin-American republics, the United States up to 1895 never made itself responsible; all the world knew the state of things. From 1829 to 1853 there were forty-eight different national governments in Venezuela, few of which felt interest in the official responsibilities of their predecessors. At

least a dozen times, foreign expeditions of European powers, and sometimes American, have blockaded and bombarded ports, occupied places, even marched into the interior of delinquent countries, in order to secure the payment of claims upon such countries. The Olney Doctrine put this whole question on a different footing; for if "the fiat of the United States is law upon the subject to which it confines its interposition," and the United States should by that fiat prohibit foreign interventions for the collection of just claims, who is to pay the piper?

The success of our diplomacy in the Venezuelan episode not only established the presumptive right of the United States to interfere in behalf of a weak neighbor engaged in a quarrel with a stronger European power; it also threw upon the United States the responsibility of seeing to it that no weak neighbor should defy European powers, when itself in the wrong. Therefore, in 1902, the permission of the United States was practically asked by England, Germany, and Italy to make a military demonstration against Venezuela; and no objection was interposed, provided no territory was to be occupied, even temporarily. The present status of the Monroe Doctrine on that question, therefore, seems to be that foreign creditors, who cannot get a settlement from delinquent nations must accept the judgment of the United States both as to the reasonableness of their demand and as to the method of collection.

If this principle applies to the old remnants of Spain and Portugal, it equally applies to the two independent powers on the island of Santo Domingo, and, in 1905, President Roosevelt announced with reference to the republic of Santo Domingo that: "The patience of her foreign creditors had become exhausted, and at least two foreign nations were on the point of intervention, and were only prevented from intervening by the unofficial assurance of this Government that it would itself strive to help Santo Domingo in her hour of need. . . . . It is not of the slightest consequence whether we grant the aid needed by Santo Domingo as an incident to the wise development of the Monroe Doctrine, or because we regard the case of Santo Domingo as standing wholly by itself, and to be treated as such, and not on general principles or with any reference to the Monroe Doctrine. The important point is to give the needed aid."

A treaty was negotiated with Santo Domingo which distinctly recognizes the right of the United States to supervise the ad-

ministration of the Domingan finances, but it has not yet been ratified by the Senate. For the time at least the United States stands in the position of a kind of administrator in behalf of all of the foreign creditors, for the purpose of rendering unnecessary any other form of interference.

These various appeals to the Monroe Doctrine have lead President Roosevelt, in messages and public addresses, to re-state the grounds and extent of the Doctrine. In his message of 1902 he said: "No independent nation in America need have the slightest fear of aggression from the United States. It behooves each one to maintain order within its own borders and to discharge its just obligations to foreigners. When this is done they can rest assured that, be they strong or weak, they have nothing to dread from outside interference." But in his message of 1905 he intimated that the United States reserves the right of intervention, either in its own behalf or in that of foreign nations: "Such action will not be taken with a view to territorial aggression, and it will be taken at all only with extreme reluctance and when it has become evident that every other resource has been exhausted." Under this exposition the Monroe Doctrine, much enlarged and altered since Monroe first promulgated it, prevents the planting of colonies in America, prevents the use of military force in collecting claims and indemnities, and authorizes the United States to keep its neighbors up to a reasonable standard of good order and financial responsibility toward foreigners.

The prime reason for this doctrine was stated by President Roosevelt, in 1904, as follows: "In asserting the Monroe Doctrine, in taking such steps as we have taken in regard to Cuba, Venezuela, and Panama, and in endeavoring to circumscribe the theatre of war in the Far East, and to secure the open door in China, we have acted in our own interest as well as in the interest of humanity at large." In his message of 1901 he took pains to point out that: "This doctrine has nothing to do with the commercial relations of any American power, save that it in truth allows each of them to form such as it desires. In other words, it is really a guaranty of the commercial independence of the Americas."

Like many of his predecessors, President Roosevelt, in his message of 1901, disclaims territorial ambition by the United States: "The Monroe Doctrine is a declaration that there must

be no territorial aggrandizement by any non-American power at the expense of any American power on American soil. It is in no wise intended as hostile to any nation in the Old World. Still less is it intended to give cover to any aggression by one New World power at the expense of any other." The reason for this principle has never been more clearly stated than by the President in 1905: "One of the most effective instruments for peace is the Monroe Doctrine as it has been and is being gradually developed by this Nation and accepted by other nations. No other policy could have been as efficient in promoting peace in the Western Hemisphere and in giving to each nation thereon the chance to develop along its own lines. If we had refused to apply the Doctrine to changing conditions it would now be completely outworn, it would not meet any of the needs of the present day, and indeed would probably by this time have sunk into complete oblivion. It is useful at home, and is meeting with recognition abroad because we have adapted our application of it to meet the growing and changing needs of the Hemisphere. When we announce a policy, such as the Monroe Doctrine, we thereby commit ourselves to the consequences of the policy, and those consequences from time to time alter. It is out of the question to claim a right and yet shirk the responsibility for its exercise."

GEOGRAPHICAL FIELD OF THE MONROE DOCTRINE SUMMARIZED.

How far have the "changing conditions" and "the growing and changing needs of the Hemisphere" altered the geographical application of the Monroe Doctrine? The phrase now, as from the beginning, applies only to the Western Hemisphere, but no longer rests on the doctrine of the two spheres; its present basis is that the United States, as the most populous, most developed and most forth-putting community in America, has successfully asserted a special interest in American affairs, which it will share with no other power.

(1) In the seventy-three years since Monroe's message, certain areas have been withdrawn from the scope of the Monroe Doctrine by incorporation into the United States; these are Texas, New Mexico, California, that part of Oregon eventually secured by the United States, and Porto Rico; in addition, Cuba and Panama are practically dependencies of the United States.

(2) The next group is that of the Latin-American countries

which were existing in 1823, and the fragments into which some of them have since been divided; that is, Mexico, the Central American states, Venezuela, Colombia, Ecuador, Peru, Bolivia, Chile, The Argentine, Uruguay, Paraguay, and Brazil. In none of the enunciations of the Monroe Doctrine made by authority, except those of Polk and Cass, has there been a distinction between North and South America.

(3) Another group of territory is the British colonies, being the Dominion of Canada, Newfoundland, the Bermudas, Jamaica, and other West India Islands, British Guiana, and British Honduras. Though frequently assailed under cover of the Monroe Doctrine even as late as 1895, the withdrawal of Great Britain from the Isthmus Canal has removed the principal cause of friction with our greatest American neighbor, and thereby makes unnecessary the application of the Monroe Doctrine to any question likely to come up between the two powers; the British colonial empire in America will hardly be disturbed except by war or revolution.

(4) The fourth group is the other European colonies, being the little French islands of St. Pierre and Miquelon, the French West Indies, French Guiana; the Dutch Islands, Dutch Guiana, and the Danish Islands, upon the last of which the United States have practically a pre-emption, through their well-known desire to annex them.

(5) The last group is the island of San Domingo, which is just now in a transition state; almost a protectorate, possibly to be annexed to the United States, and absolutely beyond the possibility of incorporation by any European power, partly from the Monroe Doctrine, still more from our obvious paramount interest.

This summary covers in one way or another the whole of the two Americas, which may be re-analysed as consisting of: (1) the continental territory of the United States, including Alaska; (2) four regions, Panama, Cuba, the island of San Domingo, and the Danish Islands, in which the United States has a special interest, which no European nation would for a moment question; (3) the European colonies, British, French, Dutch, against which there is at present no hostility in the United States; (4) the continental fragments of the old Spanish and Portuguese empires, to which alone the Monroe Doctrine is at present applicable as a vital principle.

Would it be possible, would it be advantageous, to set aside a part of South America as outside the limits of the Doctrine, and draw say the line of the Amazon River, as a limit beyond which the interests of the United States are to be considered as not opposed to European interference or colonization. Historically there is no argument for this division since our government has never made any such distinction; there is to be sure a different feeling toward Chile and the Argentine, but not because they might be a field of conquest; on the contrary, they seem able to take care of themselves and so to prevent conquests. The real motive for establishing such a line would be to give Germany the opportunity of American colonization.

The suggested raising of the Monroe embargo in favor of Germany is, however, not strictly necessary for the end desired. If enough Germans were so minded they might make a second Texas of Brazil, by emigration thither till in force enough to control the government; the difficulty is that nobody feels any assurance that Germans in Brazil would wish to be colonists of the German Emperor, or could "deliver the goods." A German Brazil would be almost certainly an independent power, and as such might very likely invoke the protection of the Monroe Doctrine.

Any geographical distinction is in conflict with the fundamental reason for the Monroe Doctrine as stated by President Roosevelt in several messages, viz., that it is a doctrine of peace; and such it has normally been. The Monroe Doctrine prevents the creation of centers of friction and disturbance, and it saves the Americas from the fate of Africa and Asia. To see those rich and prosperous regions, which might furnish homes for millions, left to sloth and misgovernment is painful; but the occupation of parts of Africa by Germans and the Belgians and of parts of Asia by France, has not removed sloth and misgovernment from the colonized areas. The Amazon Valley and the La Plata Valley, together containing by far the most valuable part of South America, are already receiving large numbers of European colonists, from whom may eventually come a reorganization of the government under which they live; and they ask for no withdrawal of the Monroe Doctrine. The experience of a hundred years shows that the Doctrine has at least kept the Americas out of the scramble of European diplomacy: all the reasons for asserting it at all apply to the more distant as well as the nearest sections of Latin-America.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

PERSONNEL AND PROMOTION REDUCED TO ITS SIMPLEST TERMS.

By COMMANDER ROY C. SMITH, U. S. Navy.

PRELIMINARY.

1. There are two fundamental principles that will scarcely admit of doubt or argument. One is that in any given list of officers, including all the grades, the numbers in the various grades should bear a certain fixed ratio to each other. This is dependent on the duties of the various grades and may be easily determined. The object of keeping the ratio fixed, whatever the total number, is that if the navy is short, all the grades will be equally short; if it is at full strength, all the grades will be at full strength, and employment will be uniform. Fixed numbers in the grades are logical only when the total number is fixed. If the total number is varying rapidly, fixed numbers are entirely illogical.

2. The second fundamental principle is that the duties of the various grades cannot be performed efficiently unless there is some recognized relation between the age and experience of the officers and the duties to be performed. For the purposes of this article, age and experience may be reduced to length of service. There are differences, it is true, in the ages of the members of the same Naval Academy class, but the difference is one established by legislative act and is supposed to be within the limits of the age requirements for the same kind of duties. If it is not, the limit should be changed. For all the upper grades, experience is a prime requisite, and experience comes with length of service. The duties of any grade are best performed by an officer whose training and experience have been sufficient, and whose age is suited to the mental and physical exactions of the required duties. Total length of service is evidently the best criterion for determining these qualifications. An age criterion is not logical unless an absolutely fixed age is established for entrance to the Naval

Academy, as for example exactly 16 years, which is clearly not practicable.

3. Granting these fundamental principles, it will be necessary to determine, first, the ratio between the numbers in the grades, and second, the length of service requisite to promotion to each grade. This is fortunately not difficult. The first matter has been worked out a number of times, in reports of the Bureau of Navigation, in proposed legislation, and in papers prepared for this Institute. There are two general principles involved, first, to secure a suitable proportional number in each grade; second, to ensure that the relation between the numbers and length of service in any grade is so regulated that there will be a normal flow into the grade above. If there are artificial reductions of numbers, such reductions should be made uniformly, in order not to bring fluctuating demands on the reserve strength of the grades considered as feeders of the ones above.

4. As to the length of service requisite to promotion, the available guides are the consensus of service opinion and the examples of foreign services. In considering foreign services, the practice of the generally recognized most efficient services will carry the greatest weight. The general principle is that an officer should pass a length of time in each grade sufficient for him to master the duties of that grade, and to give him the experience necessary to take up the duties of the grade above. He should not be kept in subordinate positions beyond the age at which experience teaches that the average man loses initiative and is unwilling to assume responsibility or act independently. Above all, flag-officers when promoted should have enough years ahead of them to enable them to put in practice the experience they have gained in their whole previous career; which is, for them, merely the training for the work they are now called on to perform.

5. Acceptance of these principles would indicate that officers should be promoted to each grade on the completion of the length of service which has been decided as fitting them for the proper performance of the new duties. If as a result, it should be found that there is a larger proportion of officers in any grade than the proportion which has been decided as suitable, then the excess over such proportion should be diverted in some way from the active sea-going duties of the grade. The most natural way would be to form a separate or reserve list for shore duty only,

except in time of war, and to select out from the whole grade as many officers for such reserve list as would be necessary to nullify the excess. The officers selected out would be those least fitted for the active sea-going duties of the grade; the ones remaining would be naturally the best fitted.

6. The recommendation of this method is its absolute simplicity. No calculation is required whatsoever. Each year there is an actually existing condition. There is, or there is not, an excess of officers of the proper age, training, and experience—that is to say, total length of service—to perform the duties of any particular grade. If there is such an excess, then all there is to do is to remove it to another list, preferably a reserve list for shore duty only. There is another indirect way of accomplishing the same object. Calculate the average percentage that would have to be removed to secure suitable promotion, then when the average age of a grade becomes too high remove such percentage. This would work on the average. But there might come a "hump" in the list, and even if the average percentage should be removed persistently each year, the age would still remain too high and there would be no way to correct it without new legislation, or waiting for the "hump" to pass. But there is no reason for going to so much complication. If a gardener wishes to trim a hedge to a suitable shape, he does not calculate how fast the twigs grow and then cut off so many inches of each one each year, but he follows a given line or his eye, and cuts off all that have grown beyond the curve he wants. So with the Navy personnel. The ratio of the numbers in the grades and the suitable length of service once established, there is nothing to do but to remove the excess *as it actually exists* at the time of the removal.

7. In the situation in which the Navy personnel now finds itself, and for a number of years to come, or until the expiration of the term set by the Act of March 3, 1903, which doubled the midshipmen at the Naval Academy, that is, 1913, no other principle need absolutely be taken into account to secure a simple and satisfactory regulation of the personnel. At the conclusion of that term, however, it will be necessary to take account of another and third fundamental principle. In 1913, the numbers at the Naval Academy go back to the old allowance, or one-half the present allowance. In 1903, when the present law was passed, the old allowance was not sufficient to fill the annual vacancies in the

then existing Navy List, and the unfilled vacancies at the foot of the list increased from year to year. Much more will it be insufficient in 1913, provided the total list at that time is in any way adequate to a very much increased *matériel*. Hence it would be very much better to arrange this matter now, when there is time; the more so as the whole regulation of the personnel can then be placed on a simple and satisfactory basis that will accommodate itself to any changed conditions that may arise.

8. The personnel exists for a certain very definite object, that is, to man the ships of the Navy. It seems puerile to state such an evident truism. And yet everybody seemed oblivious of its existence from the taking in hand of the new Navy a quarter of a century ago to 1903, when the midshipmen at the Naval Academy were doubled. Necessary as was that procedure at that time, it was a heroic remedy. The whole organized routine of the Naval Academy and of the Navy was thereby upset. It would have been in every way better had this increase been made gradually. There will be ten classes, eventually, of double strength, which will result in much complication in duty and promotion. And under the law, a similar reverse situation will exist in 1913. By that time the Naval Academy and the Navy will have adjusted themselves to the large classes, when by as sudden a change the old conditions are to be resumed. There ought to be a way to prevent this kind of see-sawing. In civil life when a steamship company places a new ship on its line, it at once increases its personnel by the number necessary to man the new ship. This seems so simple and obvious that the only wonder is how the Navy could have *avoided* such a course to the year 1903, at least with regard to the officers; for the men have simply had to be increased. The necessity has been as great for the officers, but an officer's limit for extra work is, from the nature of his training, very high; and he can work for long periods at high tension. Nevertheless, it is bad policy to subject him often to this high tension, especially when, as now, there is no reason for it. The third fundamental principle is that the total personnel should be proportional to the total shipping, and in point of importance it is the first.

9. There are various ways of establishing such a proportion. One would be to compute the complement of officers and men for each ship built and building, and allow a certain number more

for shore stations and reliefs. The total would be the proper strength of the personnel for the time being. As this number would vary to some extent from year to year, and it would be impossible to secure legislative authority for small changes, nothing would be done until the situation became exaggerated. This is practically the present method. A far simpler method, and one far more satisfactory, is to establish a permanent relation between the officers and men and the total tons of shipping. In a large service, with ships of certain recognized types, and with certain recognized shore duties to perform, this relation once established would hold good for indefinite periods. Very material changes in the amount of shipping would then entail corresponding changes in the personnel, but if the relation were suitably established, the changes would not produce the least complication in the duties. The only chance of complication would be in case the changes in the total amount of shipping were so sudden that the personnel could not be regulated fast enough to meet them. But this condition need not be feared. If the shipping were reduced, the appointments to the Naval Academy could be reduced in proportion, and the condition would in time pass away. Under the opposite supposition of a sudden increase, the midshipmen can always be increased faster than the ships can be built; provided always that the increase in the appointments is made in time. If in the ten years from 1903 to 1913, the short-sightedness of the previous twenty years can be corrected after a fashion, nobody doubts that it will be perfectly easy to allow for any possible increase of shipping by authorizing ships and personnel together. As, in the consideration of the other two fundamental principles, ready means were indicated for arriving at suitable proportions for the grades, and at the length of service requisite to promotion, so now there will be no difficulty in arriving at a proper ratio of personnel to tons of shipping. Data will be found in the practice of foreign services and in the reports of the Bureau of Navigation.

10. The above indicates the essential principles of a simple regulation of personnel and promotion. There are only three matters to be determined at the start, the ratios of the grades, the length of service requisite to promotion, and the ratio of personnel to tons of shipping. These matters once settled the next undertaking will be to apply them to the existing navy list. The

principles cannot be wholly applied at once, for the list would contain admirals who had never been captains. The application would have to be gradual, but it should be based on one or two absolutely simple rules, without provisos of any kind; for as soon as a law is burdened with provisos it becomes artificial, and no artificiality is required in putting the personnel on a satisfactory basis. There must be no dealing with theoretical conditions, or average conditions, but with conditions as they actually exist. The fundamental principles may now be taken up in succession and an effort be made to arrive at a settlement of the preliminary matters involved.

THE RATIOS OF THE GRADES.

11. These may be best settled by referring to the official reports of the Bureau of Navigation dealing with the subject, to proposed legislation prepared under sanction of the Navy Department, and to well-considered individual papers prepared for this Institute. For the present it will be simpler to consider only the grades below flag rank.

12. The Report of the Bureau of Navigation for 1901 gave the following as suitable figures for the grades below flag rank:

Rank.	Number.	Per Cent.	
Captain	70	4.9	12.8
Commander	112	7.9	
Lieutenant-Commander	170	11.9	
Lieutenant	350	24.5	75.3
Lower grades	724	50.8	
Total	1,426	100.0	

The figure for the lower grades, 724, is made up of 600 recommended in the said report and 124 naval cadets (passed midshipmen) doing duty at sea. It has been thought simplest to take in the passed midshipmen in all the figures to be quoted, for they have left the Academy and are actually performing duty aboard ship.

13. The next year's Report, 1902, recommended as follows:

Rank.	Number.	Per Cent.	
Captain	70	4.9	12.7
Commander	112	7.8	
Lieutenant-Commander	200	14.0	
Lieutenant	350	24.4	73.3
Lower grades	700	48.9	
Total	1,432	100.0	

14. The Report for 1904 gives a table of ships built, building, and authorized, with the actually required complements of officers of all ranks. This table does not take account of officers for shore duty, for reliefs, or for auxiliaries in time of war. The report recommends, however, 300 lieutenant-commanders and 600 lieutenants (a total of 900 against the 784 of the table). The lower grades could probably be increased in the same proportion, which would give 1356 against the 1181 of the table). Nothing is suggested for the captains and commanders, as increased by the requirements of shore duty, etc., but it will not be amiss to take the ratio of the last two reports quoted, that is 5 per cent and 8 per cent, approximately. The result will be as follows:

Rank.	Number.	Per Cent.	
Captain	130	5.0	13.0
Commander	207	8.0	
Lieutenant-Commander	300	11.6	
Lieutenant	600	23.1	75.4
Lower grades	1,356	52.3	
Total	2,593	100.0	

15. The next estimate of importance is that of the General Board bill of 1905 (H. R. 18634), which recommended as follows:

Rank.	Per Cent.	
Captain	6.0	14.0
Commander	8.0	
Lieutenant-Commander	16.0	
Lieutenant	30.0	70.0
Lower grades	40.0	
	100.0	

16. Lieutenant-Commander Key's article in the March, 1906, number of the INSTITUTE recommended as follows:

Rank.	Per Cent.	
Captain	7.0	14.0
Commander	7.0	
Lieutenant-Commander	18.0	
Lieutenant	41.0	68.0
Lower grades	27.0	
	100.0	

17. Finally, the present authorized ratios, were the grades at full strength (allowing 174 passed midshipmen, which was the number on the list January 1, 1906), are as follows:

Rank.	Number.	Per Cent.	
Captain	70	5.6	14.5
Commander	112	8.9	
Lieutenant-Commander	200	15.9	
Lieutenant	350	27.9	69.6
Lower grades	524	41.7	
Total	1,256	100.0	

18. These six estimates may be summarized as follows:

Rank.	Maximum.	Minimum.	Average.	
Captain	7.0	4.9	5.6	13.5
Commander	8.9	7.0	7.9	
Lieutenant-Commander	18.0	11.6	14.6	
Lieutenant	41.0	23.1	28.5	71.9
Lower grades	52.3	27.0	43.4	

19. As bearing out the above estimates, the House Report on the current Naval Appropriation Bill (H. R. 18750) contains an estimate, no doubt obtained from the Navy Department, of the proper total strength in 1908. There are two parts, first what might be called a "peace" total, second a "war" total, the latter with increased numbers, principally in the lower grades, to allow for putting reserve ships in commission, manning colliers, etc. If the "peace" total is taken as the normal condition, relying on volunteers to bring it up to the "war" total, the ratios below flag rank are as follows:

Rank.	Number	Per Cent.	
Captain	97	4.9	10.8
Commander	116	5.9	
Lieutenant-Commander	318	16.1	
Lieutenant	521	26.3	73.1
Lower grades	925	46.8	
Total	1,977	100.0	

The results do not differ materially from the earlier estimates. There are fewer commanding officers and more in the grades below; but the proportions are probably nearer future requirements, with larger ships and an expanding personnel.

20. Were it only a question of securing a proper ratio for the

satisfactory performance of the duties of the different grades, the above estimates would be satisfactory. The question, however, as is very evident, is closely related to the length of service in the grades. The number in any grade is always the product of the number of classes in the grade by the average strength of the classes. Instead of classes it is better to speak of precedence dates. Officers gain and lose numbers in various ways, which sometimes takes them out of their own classes, but in such cases they change their predecence dates. The precedence dates on the list are of necessity always perfectly consecutive. If promotion were normal all through the navy list, the number of precedence dates in a grade would accurately represent the length of service in the grade. If promotion is abnormal, that is rapid at one time and slow at another, the number of precedence dates in a grade will not represent the length of service in the grade. This is in itself the strongest argument for promotion by length of service. Such a system makes promotion perfectly normal, that is, each precedence date goes up one date in rank each year; and this is not the case in any other system. It will always be possible to make a resonable adjustment between the ratios in the grades and the length of service in the grades; for after once determining the ratio of commanding officers, there is a certain flexibility at the margin of the other grades, as for instance between lieutenant and lieutenant junior grade, where the duties will blend, within limits.

21. Another element that will have to be considered is the annual losses in the different precedence dates. If these losses followed a uniform law, and if the classes entered at a uniform strength, then, the ratios in the grades once determined, the service in each grade would be determined at the same time. This condition will of course never exist, but the connection between the ratios and the length of service can be based on such a normal condition, and under other conditions promotions can be made as may be necessary to fulfill both requirements: that is, the numbers in the grades can be kept in the determined ratio, however far down the list it may be necessary to go to get the required numbers; and promotions can be made after the determined length of service, however much the upper grades may thereby be increased. In this last case the reserve list heretofore proposed will absorb such excess.

THE LENGTH OF SERVICE REQUISITE TO PROMOTION.

22. The guides here, as we have seen, are service opinion and the practice of foreign services. The first question is whether to commission graduates at once, or keep them a year or two as midshipmen. This point must be settled according to our own lights, as our system of education is not sufficiently like that of any other nation to make it possible to use their practice as a guide. If midshipmen enter from 15 to 17, they graduate from 19 to 21. In times past it was considered necessary to have midshipmen afloat. Laterly ideas have been changing. The General Board bill of last year, previously quoted, proposed to keep graduates one year as midshipmen and another year as ensigns. Lieutenant-Commander Key's plan, also referred to, proposed to graduate midshipmen as ensigns. The service has been some time arriving at this conclusion, but the weight of service opinion now seems to favor it. The idea has much to commend it. Graduates of West Point are commissioned at once, why not graduates of Annapolis? If they then serve 3 years as ensign and 3 years as lieutenant (junior grade), they will have a chance to make a cruise in each rank. It will also make it easy for the Department to send young ensigns to serve first in big ships and then transfer them to smaller ones, all in the same cruise, as the exigencies of the service may require. As far as the duty is concerned, it does not matter much whether the young officer is called a midshipman or an ensign. The main point is to have him there to do the work. As it is simpler to commission him at once, and as he would seem to be entitled to this small lift, it will be assumed here that such will be the adopted course. Lieutenant-Commander Key suggests 6 years in the two grades, which thus agrees with the above. Three years as ensign is also the present law. Hence in the absence of arguments to the contrary, we will assume that midshipmen enter between the ages of 15 and 17, pass 4 years at the Academy, graduate as ensigns and serve as such for 3 years, and then serve 3 years as lieutenants (junior grade).

23. This brings them to lieutenant at an average age of 26. Before deciding on the service as lieutenant and lieutenant-commander, it may be well to settle first the flag and command ranks, and then divide the remaining time suitably between these two grades. Lieutenant-Commander Key suggests 7 years in flag

rank (or 9 years for vice-admirals retiring at 64), 7 years as captain, and 4 years as commander. In the table he prints on page 287, from data supplied by the Office of Naval Intelligence, the average years as flag-officer and captain in the leading navies are given as follows:

Nation.	As Flag Officer.	As Captain.
Great Britain	8.0	11.2
France	14.2	9.5
Germany	6.0	6.2
Japan	11.0	8.0
Whence average	9.8	8.7

Hence the 7 years he suggests in each of these grades is well within reason. It might easily be increased a year in each. Before deciding definitely, it will be well to wait until length of service can be considered in connection with the ratios in the grades. In the meantime, as a tentative solution, if we allow 4 or 5 years as commander, we have something like 20 years in the three grades. This will bring promotion to commander at about 42 (retirement at 62). Hence there remains about 16 years to dispose of as lieutenant and lieutenant-commander (26 to 42).

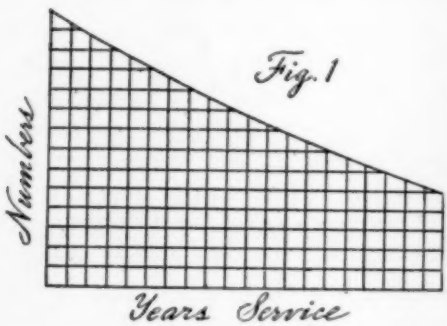
24. Lieutenant-Commander Key suggests 37 for promotion to lieutenant-commander. This seems to the writer too old. In the British House of Commons an official statement was made on June 26 last that lieutenants would reach their grade at about 22½ years and commanders at from 32 to 37. The average age of the last commanders promoted was 32 years and 4 months (*The Naval and Military Record*, June 28, 1906, p. 403). Hence 37 years for promotion to lieutenant-commander seems unnecessarily old. The officers now reaching that grade are about 35, and it does not seem desirable that they should be any older. If we accept 35 for promotion to lieutenant-commander, we shall have 9 years' service as lieutenant and 7 years' service as lieutenant-commander, which lengths do not seem unreasonable.

25. Hence, tentatively, we have something as follows:

Rank.	Service.	Total.	Average Age.
Midshipman	4	4	16 to 20
Ensign	3	7	20 " 23
Lieutenant (Junior Grade)	3	10	23 " 26
Lieutenant	9	19	26 " 35
Lieutenant-Commander	7	26	35 " 42
Commander	5	31	42 " 47
Captain	8	39	47 " 55
Flag-Officer	7	46	55 " 62

RATIOS OF GRADES AND LENGTH OF SERVICE REQUISITE TO PROMOTION, CONSIDERED IN RELATION TO EACH OTHER.

26. It has been seen that there is a certain permissible flexibility in the regulation of each of these preliminary matters. The final determination can be best arrived at by examining their relation to each other. The connection between them, as has been indicated, is the annual loss in the various precedence dates. In considering any grade, there are at least four independent variable elements. These are the strength of the entering precedence date, the annual losses in these dates, the length of service in the grade, and the total strength of the grade. Assuming some regular law as to losses, when we have determined any three of the above elements, the fourth one is likewise determined. For example, given the entering strength and the annual losses, the



strength of the grade is determined as soon as we determine the length of service; or the length of service is determined as soon as we determine the total strength. Or given the entering strength, the total strength, and the length of service, the annual losses are thereby fixed.

27. This is best seen from Fig. 1. If the ordinates represent the strength of the several dates, and the abscissæ the years of service, the curve will express the law of the annual losses, and the area of the curve will be the total strength. In the lower grades, where there is no limit of numbers, the curve is simply the curve of the natural annual losses in the different dates. We are not concerned as to its absolute form; it will take care of itself on the average, up to the grade at which we begin to separate the seagoing list from the reserve list. After that point the curve may

be given an absolute form, and then when two of the remaining three elements are decided the third follows absolutely. The more or less variable space between the fixed curve so selected and the variable curve representing the natural losses will then express the size of the reserve list, as shown in Fig. 2. *A B C* is the more or less variable curve of natural losses. *A B F E* represents the strength of a certain grade, and *F G* is the desired length of service in the next higher grade. It is found that *B C G F* gives a greater strength than is needed in the higher grade. Hence a new fixed curve *B D* is determined in such wise that *B D G F* will represent the desired strength. The area *B C D* will then evidently represent the strength of the reserve list in that grade.

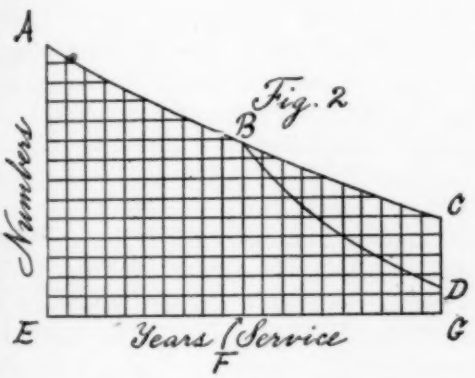


Fig. 2

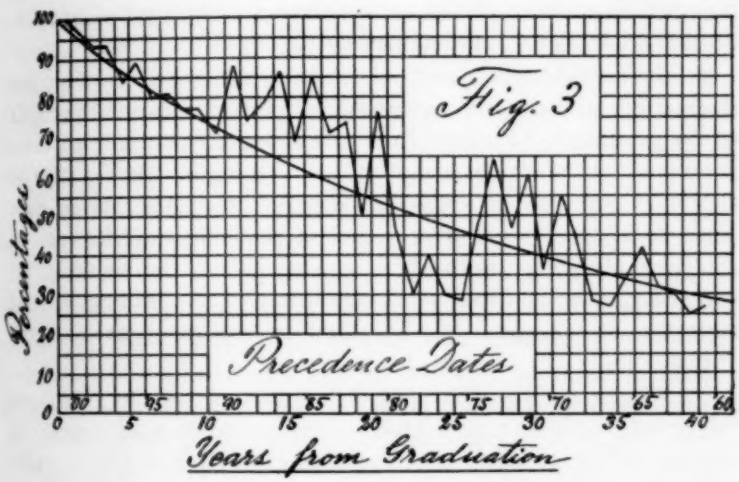
28. As to the form of *A B C* and *B D*, the former is only needed approximately, and will be sufficiently determined by examining the past losses of the precedence dates now represented on the navy list. *B D* may be given any form that seems desirable, provided the area *B D G F* truly represents the desired strength of the grade. As to the most desirable form, we may remove the same number from each date each year, when *B D* would become a straight line. This would be hardly advisable, for the number removed would be a constantly increasing higher percentage of the number remaining. As each date is a reservoir for the next higher date (of the following year), our reservoir would be having constantly increasing demands on its reserve capacity. Hence it would seem more logical to make the losses a fixed per-

centage of each date. Thus each reservoir would be drawn on to exactly the same relative extent through the whole grade, and accidental fluctuations would be on the whole less likely to exhaust its reserve supply. Consequently the curve *B D* would be preferably one in which each ordinate was reduced successively by a certain fixed percentage of itself. This then will be taken as the proper form of the curve in those grades in which it is found that the natural losses will leave more numbers in the grade than are required.

29. It will now be desirable to determine the approximate form of the curve of natural losses. Taking the last annual Register, that of January 1, 1906, the method of procedure will be to compare the present strength of each date with its graduating strength. The data for the latter will be found in the last Register of the Naval Academy Graduates' Association, that of July 1, 1904. In order to make the comparison of value in determining the approximate natural losses, several circumstances have been taken into consideration. Generally speaking, in this comparison, the graduating strength has been taken as comprising only the members who actually entered the line. For example, beginning with the class of 1881, for a number of years many graduates were discharged, others entered the Construction Corps, others the Marine Corps. These have been discarded from the comparison, for otherwise the result would show a wholly unnatural condition not now existing. The object is to determine the natural losses in the line. The former cadet-engineers, as they now form a part of the line, should naturally be counted with the graduates. Moreover, the officers now under 62 years of age who have retired under the personnel law should still be counted with their classes, for under the proposed plan they would still be in active service either on the sea-going list or on the reserve list. In the present actual strength, the list has been taken as it stands, counting extra numbers, and officers whose precedence dates have been changed, as in the places they now occupy, except that the classes entering the Naval Academy during the Civil War, who now occupy higher precedence dates, have been counted as of their entering date, which gives a more accurate result for the purposes of this comparison. Also, entries from the ranks have not been counted as yet, as there are not enough data, but it is a matter that will have to be taken up in the future. The class entering in 1860 is not

considered, for it has begun to be reduced by age retirements, and this comparison is to determine the losses previous to retirement. The results are shown in Table A.

30. To make this table clearer, Fig. 3 has been added, in which the ordinates are the present percentages of the various precedence dates in succession with reference to the graduating strength. The curve of losses does not seem to have much regularity. Certain classes have lost more, others less, without regard to their position on the list. For example, the classes entering from '76 to '80 are the heaviest losers, the classes immediately before and after them having suffered less. The causes of such irregularity



do not concern us immediately. They will probably always occur; but in a list of several thousand men under similar conditions, the irregularities would probably be smoothed out. We may approximate this condition by drawing an average smooth curve through the various points of the irregular figure, when we shall find that the loss from year to year is nearly a constant per cent. The curve so shown is in fact the actual 3 per cent curve, that is, each ordinate is 3 per cent less than the preceding one; and its area is practically the same as that of the irregular curve formed by joining the successive points. Hence we may assume without material error that the rate of loss for any year in the different precedence dates throughout the list is practically constant. Also

assuming that the classes now on the list have lost a constant percentage annually, the last column gives such loss. It is of course merely the average loss that at the end of the given length of service would produce the present strength of each date. We see that it varies irregularly through the list. The class entering in '85 has lost least, 1.0 per cent annually; and the class entering in '79 has lost most, 5.2 per cent annually. The average loss for all the classes is 2.8 per cent, or in round numbers 3 per cent. As has been stated, it is not necessary to know absolutely this loss; it will vary from year to year. But it is necessary to know what to expect on the average in order to establish a normal relation between length of service and numbers in the grades, leaving the variable reserve list as an overflow to take care of any abnormal fluctuations in the percentage of losses.

31. A disturbing element of much greater gravity than the fluctuations in the percentage of annual loss is the varying strength of the graduating classes. In all the above discussion it has been assumed that the classes are of uniform strength. As a matter of fact they vary to an excessive degree. Hence whatever plan shall be adopted must have sufficient flexibility to take care of this irregularity as well. If it can assimilate the suddenly increased classes of three years ago, simply, and without special provisos, it will probably be equal to any emergency of the future.

32. Hence we are in a position to assume that the 3 per cent curve will represent very closely the normal rate of losses. If we assume the graduating strength of each class as 100, in order to construct a normal list, it will be a simple matter to substitute later any other value that may be found necessary. Table B gives such a list, calculated for 42 years' service from date of graduation (average age of entry 16, graduation 20, retirement 62). The total of the 42 classes is 2406. The annual loss at 3 per cent would be 72. As 100 come in each year and 28 go out by retirement, the difference is the loss, or 72, as it should be. The loss by retirement is 28, or about 1.2 per cent; and the total loss from all causes 100, or 4.2 per cent, which is also 3.0 plus 1.2, as it should be.

33. We have settled practically that lieutenants shall be promoted to lieutenant-commanders after 19 years' total service, or 15 from graduation, at an average age of 35 years. The total

strength to this point, Table B, is 1222 (not 1285, since the 63 lieutenants of 15 years' service now go on the lieutenant-commanders' list). What percentage should this be of the total below flag rank? In turning back to the estimates that were quoted under the heading "The Ratios of the Grades," we should not be far wrong in taking the more recent of these estimates as a guide. The General Board Bill of 1905 (Par. 15), which was approved by the Bureau of Navigation, adopted 70 per cent up to this point (40 plus 30). Lieutenant-Commander Key (Par. 16) recommended 68 (27 plus 41). Finally the House Report (Par. 19) estimated 73.1 (46.8 plus 26.3). This last is of course the least favorable to promotion of the three, since it means a smaller proportion in the higher grades; but as the result gives a suitable proportion in these grades, it is apparently this estimate that will have to be accepted. Table B, as we have seen, gives the total strength to this point as 1222, which we now take as 73.1 per cent of the whole. The remaining 26.9 per cent will then be 450, and the total will be 1672.

34. Next to apportion these 450 numbers in the grades above lieutenant. We have selected 7 years for service as rear-admiral (the mean of the foreign services quoted in Par. 23 was 9.8). This leaves 20 years to be passed in the grades of lieutenant-commander, commander, and captain. We shall have to apply an artificial ratio of annual losses, for from Table B we see that the normal strength is 2186 to 35 years, and we only want 1672. The difference of 514 will constitute the reserve list of the same length of service. We have also seen that the best form of curve for the annual losses is the curve in which each ordinate is shortened in succession by the same constant percentage. Hence the problem is simple. We have an entering strength of 63 (Table B), a total strength of 450 as above, and a service of 20 years. The solution gives an annual loss of 13¼ per cent. (The curve of constant loss is $y = y_0 r^x$, where y_0 is the initial strength of any date, r the ratio of each date to its predecessor, and x the number of years. The area of such curve, or sum of all the ordinates is $A = \frac{y_0(1-r^x)}{1-r}$.) Table C shows the computation of this curve, for service from 15 to 35 years, with the required total area of 450.

35. We are now in a position to examine, with the aid of

Tables B and C, the relation between "The Ratios of the Grades" and "The Length of Service Requisite to Promotion." Taking the length of service in the grades as that already established tentatively (Par. 25), the rest of the below data comes directly from these two tables.

Rank.	Service in Grade.	Total Service.	Numbers from Tables.	Numbers in Grades.	Per cent.	
Ensign	3	3	291	291	17.4	
Lieut. (Jun. Grade)....	3	6	557	266	15.9	73.1
Lieutenant	9	15	1,222	665	39.8	
Lieut.-Comdr.	7	22	301	301	18.0	
Commander	5	27	390	89	5.3	8.9
Captain	8	35	450	60	3.6	
				1,672	100.0	

36. Turning back now to the various estimates quoted under the head "The Ratios of the Grades," it is seen that the figures of the Per Cent column above are within the maximum and minimum figures of the estimates (Par. 18) in every case except that of commanding officers, where they are very much too small. They are smaller even than the estimates of the H. R. Report (Par. 19). But Table C was calculated on the data of this report, and in fact the percentages of the lieutenant-commanders and commanding officers taken together, 26.9, agree with the totals of Par. 19 in those grades. Hence it will be necessary to reduce the lieutenant-commanders and increase the commanding officers accordingly. The only way to do this, bearing in mind the principles heretofore established, is to reduce the service of lieutenant-commanders and increase that of commanding officers. Otherwise it would be necessary to increase the percentage of loss in the grade of lieutenant-commander and decrease it in the grades of commanding officer. But this loss has been made uniform through the three grades, 13¼ per cent (Par. 34), the figure which gives the required total in the three grades; and to make it greater in the earlier part and less in the latter part is contrary to the principle that the demands on the reserve capacity of the reservoir should be maintained constant.

37. Hence making the service of captains 9 years, commanders 5 years, and lieutenant-commanders 6 years, the table then becomes:

Rank.	Service in Grade.	Total Service.	Numbers from Tables.	Numbers in Grades.	Per cent.	
Ensign	3	3	291	291	17.4	
Lieut. (Jun. Grade)	3	6	557	266	15.9	73.1
Lieutenant	9	15	1,222	665	39.8	
Lieut.-Comdr.	6	21	274	274	16.4	
Commander	5	26	377	103	6.1	10.5
Captain	9	35	450	73	4.4	
				1,672	100.0	

This is as close as can be got to the figures of the H. R. Report (Par. 19) without taking fractional parts of years. The lieutenant-commanders are still slightly in excess, the commanding officers slightly deficient, but the variations are not important. The settling of the above points has been a good illustration of the intimate relations existing between the different variables involved; that is, the entering strength of the date, the service in the grade, the total strength of the grade, and the percentage of annual losses. A change in any one modifies all the rest, but by keeping the principles in view, it will always be possible to arrive at just conclusions.

38. There remains the question of flag-officers and midshipmen. The authorized number of flag-officers is now 18, but on January 1 last, counting extra numbers, there were 24 on the list. The General Board bill of last year proposed 27, and Lieutenant-Commander Key proposes 24. This number of officers he shows is absolutely needed. From the table he quotes, page 296 of No. 117 of these PROCEEDINGS, it may be seen that other nations have from twice to four times as many, relative to the size of their fleet and enlisted force. While our present authorized number, 18, is manifestly far short, so is the whole navy list, even if filled to its authorized strength, which is 1256 below flag rank (see Par. 17). The authorized number 18 is about 1.4 per cent of 1256. Perhaps if the whole list were increased to a suitable strength, this percentage would give enough flag-officers. Moreover the House Report (H. R. 18750), previously quoted, in the estimate for 1908, gives 24 rear-admirals for the "peace" total of 1977 below flag rank, or a percentage of 1.2, and 28 rear-admirals for the "war" total of 2513 below flag rank, or a percentage of 1.1. As the previous figures are based on the "peace" total, the same estimate may be used now, that is 1.2 per cent of

the total below flag rank. This percentage applied to the total, 1672, of the last paragraph, gives 20 as the proper number of flag-officers.

39. The proper number of midshipmen at the Naval Academy may be determined very simply, with at least approximate accuracy. The following table gives the graduating strength of the four classes last out of the Academy on January 1, 1906, together with their strength for each year while at the Academy; also the mean strength of the four classes for correpsonding years of their course, and the percentage strength, assuming 100 as the graduating strength:

Graduating Year.	Graduating Strength.	1st Class.	2d Class.	3d Class.	4th Class.
'02	59	60	65	68	91
'03	45	50	52	55	66
'04	61	62	67	71	93
'05	111	114	122	123	144
Mean strength	69	72	77	79	99
Percentage	100	104	111	115	143

Since the figures of Tables B and C are based on a graduating strength of 100 for each class, the total number at the Academy on the same scale will be the sum of the above percentages for the four classes, namely, 104, 111, 115, 143, or a total of 473. Hence for the whole navy list we have:

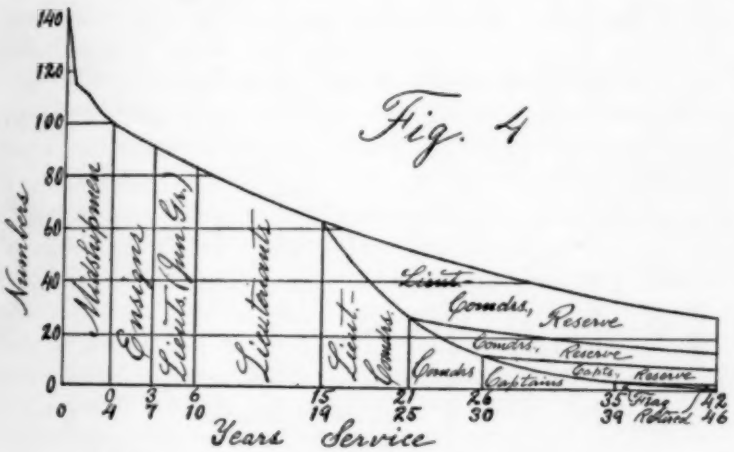
Flag (1.2 per cent of 1,672)	20
Below Flag (Tables B and C)	1,672
Midshipmen at Academy	473
Total	2,165

40. The table of Par. 37 may now be completed as below. The last column is the percentages as recommended in round numbers:

Rank.	Service in Grade.	Total Service.	Average Age.	Relative Numbers in Grades.	Per cent as Figured.	Per cent in Round Numbers.
Midshipman	4	4	16-20	473	21.8	22
Ensign	3	7	20-23	291	13.4	13
Lieut. (Jun. Grade)	3	10	23-26	266	12.3	12
Lieutenant	9	19	26-35	665	30.7	30
Lieut.-Comdr.	6	25	35-41	274	12.7	13
Commander	5	30	41-46	103	4.8	5
Captain	9	39	46-55	73	3.4	4
Flag	7	46	55-62	20	.9	1
Totals				2,165	100.0	100

The slight changes in the fractions of percentages to arrive at the round numbers of the last columns will be neutralized in practice by slight variations in the percentages of losses. These variations will be of little moment compared with the fluctuations in the strength of classes, and are calculated to be sufficiently within the reserve factor.

41. Fig. 4 shows graphically the results of this table. The years of service are marked at the base, both from graduation and for total service, the relative strength of the dates at the left margin. The upper limiting curve has the values of Par. 39



for the midshipmen at the Academy, and after that the values of the 3 per cent curve of Table B. The limiting curve in the sea-going grades of lieutenant-commander, commander, and captain, has the values of Table C. The limiting curve for flag-officers is computed to give 1 per cent of the whole number in that grade, shown also in Table C. The intermediate curves are the normal 3 per cent curves computed from the beginning of the service of commanders, captains, and flag-officers, and show what the strength would be in those grades without artificial reduction, or selection out. The respective enclosed areas evidently show the strength of the reserve list in the three grades. The flag-officers in excess of those needed would be preferably retired.

42. Fig. 5 is intended to show the condition that would exist without a reserve list, and with the total numbers the same as for

the upper 3 per cent curve, and the proportions in the grades the same as for the totals of the active and reserve list of Fig. 4. Table B gives the total area of the 3 per cent curve above lieutenant as 1184 (2406 less 1222). From the table of Par. 40, we have the relative numbers on the active list in the four upper grades, and a computation from Fig. 4 will give the reserve areas. The result is as follows:

Grade.	Active.	Reserve.	Total.
Lieut.-Comdr.	274	485	759
Commander	103	155	258
Captain	73	68	141
		Retired.	
Flag	20	6	26
Total	470	714	1,184

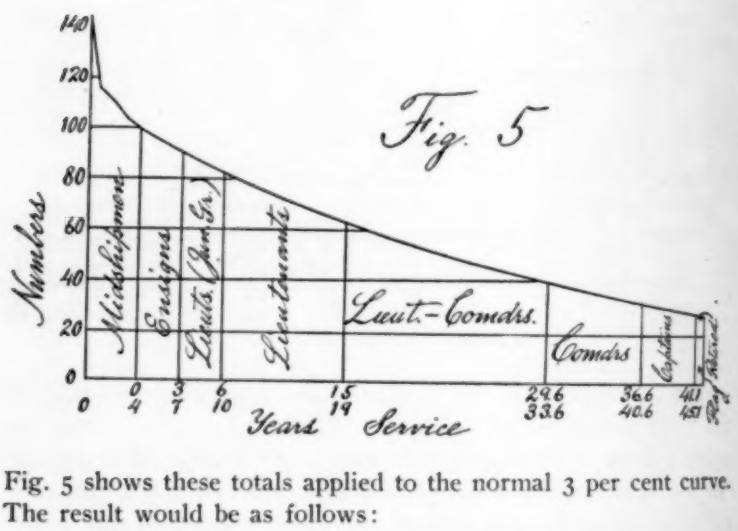


Fig. 5 shows these totals applied to the normal 3 per cent curve. The result would be as follows:

Promotion to	Total Service.	Average Age.
Commander	33.6	49.6
Captain	40.6	56.6
Flag	45.1	61.1

This approximates very closely the existing conditions as regards ages of promotion.

43. If we examine Figs. 4 and 5 with regard to the cost, since we have exactly the same numbers in the respective grades, the cost is exactly the same (not counting the saving in the pay of

the retired flag-officers of Fig. 4). The difference is that in one case the sea-going officers have a quicker promotion, and in the other case all are promoted together at an age too old to permit them to render the service that is required in the higher grades. In any event, we are struck with the relatively large size of the reserve list. From the point of view of economy, the main feature is that most of them are in the grade of lieutenant-commander, 485 out of a total of 714 (Par. 42), or about 68 per cent. Of the remainder, about 22 per cent are commanders, about 9 per cent captains, and about 1 per cent rear-admirals (these last retired). These conditions will not be onerous. As a matter of fact, however, as we shall see later, these are questions which scarcely interest this generation.

44. The results of Par. 40 could be put in effect without applying as yet the further principle that the total numbers should bear a fixed relation to the total tons of shipping. In order to put it in operation, the length of service required for promotion to flag-officer would have to be reduced gradually, this in order not to create flag-officers with no service as captains. The precedence date of '62 is now (July, 1906) being promoted to rear-admiral. Their total service is 44 years, whereas 39 has been fixed as the limit. By promoting two precedence dates each year (instead of one) this limit would be reached at the end of four years, at the fifth annual promotion. If the captains were not then down to the limit, the same method could be followed with them. As a matter of fact, by the time the admirals are straightened out the other grades will be found practically to have reached the limit also. This will be shown presently by actual application to the existing navy list. The number of flag-officers would then be taken as 1 per cent of the total list, counting the midshipmen at the Academy. The same rule could not be followed yet as to the other grades, because, on account of the present excessive ratio of midshipmen at the Academy, the lieutenants (junior grade) and ensigns would have to be recruited bodily out of the Academy. But the numbers in service below flag rank can be arranged in the adopted ratios, which plan will always be applicable. The flag-officers cannot yet be so arranged, for with the small percentage adopted for flag-officers, and the present shortage in the lower grades, we should have less than the 18 now allowed.

45. The appointments to the Naval Academy will go on at the present rate until 1913, during which time the navy list will be constantly increasing in strength; and, if a ratio in the grades is adopted, all the grades will be likewise increasing. This is the reason that the relation of total numbers to total tons of shipping need not be established immediately. But it should be established before 1913, otherwise we should at that time revert to a totally inadequate number of appointments; and it is better to establish it at once; for by so doing we can without changing the present temporary rate of appointments put in effect a complete and satisfactory system that will answer indefinitely. Hence we shall consider now the suitable ratio of numbers to tons of shipping.

THE RATIO OF NUMBERS TO TONS OF SHIPPING.

46. As has been stated, the best means of arriving at this ratio is to consult the official estimates that have been made from time to time of shortages in the personnel, and then compare the existing strength plus the shortage with the total tonnage built, building, and authorized. In January, 1902, the total of such tonnage on the annual Navy Register was in round numbers 750,000. In January, 1906, it was 946,000. These figures are exclusive of receiving ships and ships classed as unserviceable. For the intervening years the totals may be assumed to have shown a corresponding proportional increase. Hence we should have had:

1902	750,000	tons.
1903	799,000	"
1904	848,000	"
1905	897,000	"
1906	946,000	"

47. The Report of the Bureau of Navigation for the end of 1901 showed a shortage of 1026 line officers. The estimate was made on the very lowest suitable basis and allowed complements for the various ships materially less than in the case of similar foreign ships. The actual number at that time on the list, counting graduated cadets, was 1042. Adding the shortage of 1026, the total was 2068, and the ratio to tons of shipping was 2.76 per 1000 tons. The above figures considered only the officers in actual service and did not take into account the cadets at the Academy.

48. The next Report (October, 1902) found an actual shortage of 577, and estimated 623 more as needed for the ships then building, or a total shortage of 1200. This added to the 1037 of the navy list made 2237, or a ratio of 2.80 per 1000 tons of shipping.

49. The Report of October, 1903, contained no estimate of shortage. The increase had gone into effect at the Naval Academy and it was a matter of waiting for the graduation of the larger classes.

50. The Report of October, 1904, gave a table of complements required for ships built, building, and authorized, the total of which was 2078. This did not allow for auxiliaries, shore duty, or reliefs. Thirty per cent is a small estimate for such needs, which would bring the total number to 2701. This is equivalent to a ratio of 3.01 per 1000 tons.

51. The Report for 1905 does not estimate the shortage, but in the House Report on the Naval Appropriation Bill for the current year, already quoted, is the table giving the "peace" and "war" complements required for all ships built, building, and authorized, the total of which for the "peace" complements amounts to 2001. This is equivalent to a ratio of 2.23 per 1000 tons. The corresponding figures for the "war" complements are 2541 and 2.83.

52. The summary of these results is as follows:

Bureau of Navigation, 1901	2.76
Bureau of Navigation, 1902	2.80
Bureau of Navigation, 1904 (partial estimate)	3.01
House Report on Navy Bill, 1906 ("peace" complements)	2.23
Average	2.70

53. As stated above, these figures do not include the midshipmen at the Naval Academy. As under normal conditions the numbers at the Academy are 22 per cent of the whole, a total of 3.46 per 1000 tons would give the above 2.70 in service. It might be suggested that as the estimate is made to include the ships building, the above 2.70 ought to include also the midshipmen, and that then when the ships would be finished the midshipmen would be in service to help man them. But this would not be correct. For imagine the building programme suddenly

to cease and no new ships to be authorized. At the end of about four years the ships would all be finished and the midshipmen graduated. The total tonnage in service would have been increased by the ships building, about 342,000 tons, January 1, 1906. The loss by deterioration in the four years would have been some 100,000 tons, leaving a total increase of 242,000 tons. But with the numbers at the Academy adjusted to normal conditions, the graduates would have simply supplied casualties, and the total navy list would be the same as before, and consequently short by the complements of over 242,000 tons of shipping, or some 726 officers. It is true that at this moment the abnormally large classes at the Naval Academy offset this condition; but, as has been shown, it was the neglect of a generation that made it necessary to enter these abnormal classes, a circumstance that should not occur again.

54. The matter may be looked at from another point of view. Not all the midshipmen graduate, whereas all the ships building are finished in time. The number then that fail would be charged up as a part of the allowance for the ships building, and as the number of failures is about 30 per cent of the entries, this in itself would make the ratio faulty. Moreover the midshipmen must be kept at a uniform strength merely to keep the grades full; whereas there may or may not be ships building. These reasons would indicate that the numbers of officers in actual service should be the ones to bear the proper selected ratio to the total of the authorized shipping. In case of an increase of shipping these numbers can only be increased through the Naval Academy, *while the ships are building;* hence the midshipmen should be regarded as an additional allowance merely to keep these numbers full. When it has been found how many midshipmen are needed for this purpose the selected ratio can then be increased by a corresponding amount and be made to include the total personnel, midshipmen as well as officers in actual service.

55. For the practice of foreign powers, we have in the same House Report on the Naval Appropriation Bill, above quoted, a table prepared in the Office of the Naval Intelligence giving the ratios per 1000 tons of shipping for the principal powers. This table takes no account of auxiliaries and small craft, but it will be useful as a comparison. The figures quoted include engineer officers. The following is an extract:

	England.	France.	Germany.	United States.	Italy.	Austria.
Commissioned Officers	1.91	2.90	2.80	1.32	3.11	4.14
Midshipmen and Cadets ..	.79	.69	.71	1.49	.50	1.25
Total	2.70	3.59	3.51	2.81	3.61	5.39

Mean value of total 3.60.

Japan and Russia were omitted for the lack of exact data.

56. Comparing the results of the last two paragraphs it will be seen that an allowance of 3 officers, including midshipmen at the Naval Academy, per 1000 tons of serviceable shipping built, and shipping building and authorized, will be an entirely reasonable figure, and short of the requirements rather than exceeding them. This then will be taken as the proper ratio of total numbers to total tons of shipping, *i. e.*, 3 per 1000 tons.

APPLICATION.

57. Having now regulated the preliminary matters involved in the three fundamental principles, there remains to apply them. A law must be framed, the working of which must be plain and devoid of complications. Complications delay the adoption of laws and often defeat them when adopted. The problems are to bring the total personnel up gradually to full strength, 3 per 1000 tons of total authorized shipping, to arrange them in the various grades in the selected ratios, and to ensure that they shall reach these grades at the end of the selected requisite service. The matters still to regulate are the entry of midshipmen and the setting aside of the excess in the grades above lieutenant. It will be simpler to consider the last matter first.

58. The excess of flag-officers should preferably be retired. A certain number is needed for commands afloat, for important shore stations, and for reliefs. Beyond these, a reserve list for shore duty only would not seem to be required. The rest therefore should be retired. Of the flag-officers there should be both vice- and rear-admirals, the latter in two divisions for pay as now. The argument for vice-admirals has been so admirably stated in papers for this Institute and by the Bureau of Navigation that it will not be necessary to take up the question here. The chief arguments are, that the importance of certain com-

mands, such as fleets in which there are several rear-admirals, requires a vice-admiral as commander-in-chief; and in combined movements or on international occasions when several powers are represented, it is derogatory to the service and the country that the American admiral should be in a constant position of inferiority. Of the total number of flag-officers, one-fifth should be vice-admirals; one-half of the remainder, rear-admirals of the upper half; and the other half of the remainder rear-admirals of the lower half. In all of these and subsequent calculations fractions should be neglected. With the present number of 18 (which is too low), there would be 3 vice-admirals, 7 rear-admirals of the upper half, and 8 rear-admirals of the lower half.

59. The vice-admirals should be selected by the President, by and with the advice and consent of the Senate, from rear-admirals who shall have had not less than one year's service afloat in command of a division, squadron, or fleet. The retiring age for vice-admirals should be 65 years, as in most foreign navies.

60. For retiring the excess of flag-officers, a board of not less than 3 nor more than 5 vice-admirals and rear-admirals of the upper half should meet in June of each year and select out for retirement from the rear-admirals of the lower half and the precedence date of captains about to be promoted to rear-admiral a sufficient number to leave the total number of flag-officers on July 1 at its full authorized strength. The retirements so recommended should not take place until July 1, after the promotions of that date, when the officers so selected should retire as rear-admirals of the lower half. The officers of the dates concerned should be allowed to volunteer for this retirement; and their applications should be accepted in order, *at the discretion of the President*, for the best good of the service, until the applications should be exhausted or the required number of retirements should be made.

61. Similarly a board of 5 rear-admirals should meet in June of each year and select out for the reserve list from the grades of captain, commander, and lieutenant-commander, and the precedence dates about to be promoted to these respective grades, a sufficient number to leave them at their full authorized strength. As in the case of the rear-admirals, the promotions should be made first, after which the officers selected out should form a reserve list in their respective grades for shore duty. There should

be no further promotion on the reserve list. Voluntary application should be permitted here as in the case of flag-officers, to be granted *at the discretion of the President* for the best good of the service.

62. In addition to the voluntary applications for retirement as rear-admiral, for admission to the reserve list in the grades of captain, commander, and lieutenant-commander, there should be a law authorizing retirement after 30 years' service, applications for such retirement to be accepted *at the discretion of the President* for the best good of the service.

63. In the grades below lieutenant-commander, the several grades should be kept full at their authorized strength, promotion thereto being made as necessary for such purpose, and in any event at the end of the requisite total service.

64. The entry of midshipmen should be designed to keep the grades full. To establish a fixed number of midshipmen at the Academy, or a fixed number to enter each year, is not logical unless the total tonnage is kept at a fixed figure, which is clearly impracticable. The danger of establishing fixed numbers is that no change can be made until the situation becomes serious. It is like a boil, that will break in time; but it is better to keep the body healthy and the blood regulated. It is only necessary to point again to the legislation of 1903, which was not enacted until the strength of the navy was exactly 100 per cent short. What should be the number of midshipmen to enter in any year? Generally speaking, the number required to bring the total navy list up to 3 officers per 1000 tons of authorized shipping. If the navy is very short, or very much overmanned, this could not be done without entering abnormally large, or abnormally small classes, or perhaps omitting a class altogether. Hence there should be a reasonable limit for any one year, and the increase or decrease spread over a number of years.

65. As has been seen, it is very disorganizing to the Academy and to the Service to cause the strength of classes to vary abnormally. In 1903 the classes were doubled. This was a great strain on the Academy, but the swollen numbers were managed in one way or another. It will not be wise to reproduce these conditions. How much may a class be varied from normal? Going back to Par. 39, the normal entering class is 143 out of 2165, or 6.6 per cent. The class that entered in 1903 was 313, making a

total navy list of about 1700; percentage 19. In view of these figures, if 6.6 per cent is accepted as the normal entering class, the maximum class could easily be increased to 9 per cent, which is a very small figure compared with the 19 per cent of the 1903 entering class. The minimum class should not be less than 5 per cent.

66. These figures may be illustrated as follows: the present total tonnage (Par. 46) is 946,000, which at 3 per 1000 tons requires a total navy list of 2838. The normal entering class, at 6.6 per cent of this total, is 187. Now suppose that next year no new construction is authorized and there is 4 per cent loss by deterioration. The total tonnage next year will be 908,000, and there should be a total navy list of 2724, or a loss of 114. The normal entering class (6.6 per cent of 2724) is 179, instead of the 187 of the year before. But to reduce the total list more quickly by the 114 numbers excess, it is recommended to make the entering class 5 per cent of the total, or 136. This is as much of a variation as should be permitted in successive classes, 187 to 136. The difference of 43 numbers between the normal class of 179 and the class of 136, together with the increased selections out in the grades above lieutenant due to the application of the ratios to a reduced total, will very soon bring down the strength to normal, in two to three years. But the case selected is an extreme one, not likely to occur.

67. Next for a sudden increase in tonnage; suppose 100,000 at the next session of Congress. With a loss of 4 per cent, as before, there would be 1,008,000 tons next year, requiring a total navy list of 3024, a gain of 186 numbers (3024 less 2838). The normal entering class, 6.6 per cent of this, is 199, against the 187 of the year before. The limit, or maximum entering strength, where numbers are to be gained, has been taken as 9 per cent. This would give 272 as the entering class. The difference of 73 (272 less 199), together with the reduced selections out in the upper grades, would make up the deficiency in two or three years. Hence in two extreme cases, the variations, while as large as should be permitted, have not approached the abnormal variation of 1903, nor the contrary abnormal variation that will occur in 1913 under the operation of the existing law.

68. To put this method of entry into effect will require a slight change in the present law, but only a slight one. The total num-

ber of appointments will not be changed, in fact in a few years it will be diminished. The method is to have the various Senators and Representatives, and the President, make their appointments in rotation, as may be required to fill vacancies, no account being taken of failures. There is no particular in which such method does not appear to be preferable to the present one.

69. The present law (Act of March 3, 1903) says: "The Secretary of the Navy . . . . shall equitably distribute the increase among the several States, Districts, and Territories, so that ultimately, if practicable, each Senator, Representative, and Delegate may recommend for appointment during each Congress one midshipman." This provision has never been carried out, nor can it be caried out without adopting the method suggested. For example, suppose all the appointments are for once equitably distributed. They would remain so indefinitely were there no failures of candidates or midshipmen.

70. Under the new law, if a member of Congress fails to make his appointment before March 4, the Secretary may fill it. But if the candidates (principal and alternates) fail after June 1, there is no longer time to fill the vacancy, which then exists through the following year. The present total number allowed at the Academy is 983. On January 1 last there were 873, or a shortage of 110. It is possible that this shortage was somewhat excessive because the increase of three years ago had not gone fully into effect. But the same conditions exist again this summer, when, owing to failures of candidates, there are about a hundred vacancies. Under the actual system there will always be a shortage, as there is no way to prevent such vacancies as those described above.

71. Similarly if a midshipman fails during his course, it brings a new appointment to his Senator or Representative sooner than would otherwise be the case, and in a few years the equitable distribution has entirely disappeared. There are about 30 per cent of such failures during the course in each class. Hence to graduate a midshipman every four years there must be on the average an appointment every three years. In the 1905 list of vacancies, there were 222 Congressional districts represented, among which 36 districts had two vacancies. As the appointments are supposed to be spaced at two-year intervals, in order to bring both appointments in any district in the same year, one would have had

to be displaced two years. In these districts under normal circumstances there would be no other appointment for three years. One year's displacement of an appointment would make the two in the district follow each other in consecutive years. There were probably twice as many districts in which that situation existed as there were of districts in which a double displacement had brought both appointments in the same year. Hence of the 222 districts there would have been 36 with double appointments, about 72 with consecutive appointments, and about 114 only in which the appointments were evenly spaced. Such a situation is far from satisfactory from the point of view of the young men of these districts who are seeking appointments, and it is forcibly contrary to the expressed will of Congress.

72. To correct these difficulties, all that is necessary is to make appointments in regular rotation until all vacancies are filled. If a candidate and his alternates fail, the appointment goes to the next district on the list, and so on in succession. If a midshipman at the Academy fails, it makes one more vacancy for the entering class. It is not even necessary to know who gets it. All the failures are divided among all the districts. After an officer graduates, he is not carried to the charge of his district. If he leaves the service for any reason, that does not give a new appointment to his district; then why make a distinction at the Academy? When all the districts have had a perfectly even chance in the matter of appointments, the obligation should end. And there is no other way to have an even chance in appointments, other than by dividing all the failures among all the districts, and making the appointments in rotation. Incidentally it is apt to exercise a pressure to prevent failures, especially among the candidates for entry.

73. There are several ways of carrying out this plan. One would be to estimate the vacancies for the coming year at the time of ascertaining the total tonnage, then make a sufficient number of designations, previous to March 4 following, to be certain to fill the actual vacancies that would exist on June 30. To do this, besides estimating the vacancies, it would be necessary to allow for a certain number of failures of principals and alternates, as determined by experience, increasing the estimate accordingly. This method to be effective would result usually in finding on June 30 that there were more qualified candidates than vacancies.

It is true that the candidates left over could enter the next year; but there would be complications as to age, as some of the candidates would be too old the following year, and there would also be the inconvenience of two trips to Annapolis and the long interval of suspense. A much better method would be the following: Having ascertained the total tonnage for the beginning of any fiscal year (in the manner hereafter to be described), and thence the suitable total personnel; with this as a basis ascertain the shortage on July 1, exclusive of the then entering class of midshipmen, and assume this shortage as the number to be made good the following year. The personnel would thus be a year behind the shipping; but the advantage is that it gives an exact number of vacancies to be estimated for, and the method would be self-corrective year by year. The designations should still be greater than the ascertained shortage, in the proportion found by experience to be necessary to secure the full number of appointments, thus allowing for a certain number of failures of principals and alternates: but all the candidates found qualified should be admitted. It would not matter in the end if the resulting numbers were slightly short, or slightly in excess of the ascertained shortage. The inequality would correct itself automatically the following July 1, the shortage at that time appearing as slightly larger or slightly smaller than if the exact number had entered the previous year. These inequalities would in any case be quite within the limit of accidental variations from other causes. The Secretary would each year, as soon as possible after July 1, cause to be printed a list with all the nominating authorities arranged in numerical order, and numbered. Accompanying the list would be a statement of the full number of designations to be made, which number would be the shortage as previously ascertained increased in the suitable proportion, as found by experience, to give the full number of qualified candidates. This list and statement would be sent to all Senators, Representatives, Delegates, and the President, who would make their nominations to the number indicated. All the candidates thus designated (principal or one of the alternates) would be appointed if found qualified. A similar full list would be printed the following year, on which number 1 would begin, in the order of rotation, next after the last designation of the previous year. Such method, besides keeping the vacancies filled, would keep the ap-

pointments evenly spaced; and there is no other means of accomplishing these ends.

74. In putting it into effect the districts that had two appointments in the current year would be the last on the list, those that had one appointment this year and one last year would be next ahead of them, and so on in the order of elapsed time and the spacing of the last appointments. In order to have each entering class represent equally all parts of the country, it would be necessary to divide the whole list of nominating authorities into several divisions, four, for instance; in each of which all the states, districts, and the President would be equally represented. The Senators of half the states would appear in the first and third divisions, and of the other half in the second and fourth divisions, this to equalize the appointments from the states at large, and also to equalize these appointments in each state. Similarly the Congressional districts of each state would be divided as equally as possible among all four divisions, as would the Presidential appointments.

75. The proportion of appointments should remain as at present with one exception. Appointments to West Point include one from each Congressional district, one from each Territory, one from the District of Columbia, two from each State at large (one for each Senator), and forty from the United States at large. These should also be the proportions for the Naval Academy; which they are, with one exception, the midshipmen at large. At Annapolis, in the above proportions, there are only ten midshipmen at large, or only a fourth as many as at West Point. Actually for the next seven years the numbers are all doubled, two for each Senator, Representative, Delegate, and the District of Columbia, one for Porto Rico, and twenty at large (instead of eighty, as the West Point proportion would give). The wording of the law as to appointments at large is five each year, but this is construed to mean twenty at the Academy. There does not seem to be any special reason for this discrimination against the Naval Academy in the matter of appointments at large; it would doubtless be corrected if suitably presented.

76. Hence it will be assumed that appointments to the Naval Academy will be made in the proportion of one for each Senator, Representative, and Delegate in Congress, one for the District of Columbia, one for Porto Rico, and forty at large; and that

such appointments will be made in regular rotation without regard to failures of candidates or of midshipmen at the Academy, and in such numbers as will bring the total strength of the personnel, including midshipmen, to 3 per 1000 tons of serviceable shipping built, and shipping building or authorized; but the total number of such appointments in any year should not be less than 5 per cent nor more than 9 per cent of the total authorized strength of the navy list as above determined.

77. The total amount of such tonnage should be ascertained each year, at the beginning of the fiscal year, by the Board on Construction of the Navy Department, and such total, approved by the Secretary, should be transmitted to Congress with the estimates of the succeeding fiscal year. This practice makes the numbers for the personnel a year behind the shipping, but this delay is necessary in order to decide on the prospective vacancies for midshipmen sufficiently in advance, also to regulate the matter of the numbers in the grades and the total personnel previous to the beginning of any fiscal year. The estimates for Congress should contain the numbers in the grades as thus determined, and such numbers should hold for the ensuing fiscal year. At the beginning of the fiscal year, on July 1, promotions should be made in accordance with the new adjustment, and during the year promotions to fill vacancies should be made as now.

78. As soon as possible after the beginning of each fiscal year the Secretary should forward to the President, Senators, Congressmen, and Delegates the printed list of appointments as described in Par. 73, and the appointments of the next year should be made in the order of this list. The nominations should be made previous to the ensuing March 4, as now; failing which the Secretary should nominate, as in accordance with present law.

79. Also the age limits for entry should be made 15 and 17, instead of 16 and 20, as at present; but the change should be made gradually in order not to debar young men now seeking appointments who might be disqualified were the whole change to be made at once.

80. Such then is the system recommended for the regulation of the personnel and promotion therein. As has been previously explained, it cannot be put fully into effect by a stroke of the pen; that is to say, it is not advisable to make it fully operative immediately. There is nothing in the system itself to prevent;

but, as has been explained, it is not advisable to create admirals who have not been captains. To avoid this contingency, and also to bridge over the time until the whole list shall have been increased to normal strength, a few modifications will be necessary, as follows:

81. In the year in which the new law goes into effect, ascertain the length of service of the precedence date then arriving at the grade of rear-admiral; promote all of such precedence date, and also the following date, immediately; in other words reduce the actual length of service necessary for promotion to rear-admiral by one year; and repeat this each succeeding year until the precedence date is reached and promoted that has a total length of service of 39 years, when the system will be in operation as far as the flag-officers are concerned.

82. If, in the course of such reduction, captains come up for promotion who have not finished a cruise as captain, their places should be held open for them temporarily, and they should be allowed to finish their cruises. This will only be necessary at the start, and then only in the cases of captains who have got their commands late. The same rule should hold temporarily for commanders coming up for captain.

83. Next, having ascertained the total tonnage, and thence the total personnel at the rate of 3 officers, including midshipmen, per 1000 tons, if 1 per cent of this total, or more, are found in the grades of flag-officer, retain 1 per cent on the active list and retire the rest, in accordance with the provisions of Par. 58. Should there be less than 1 per cent, retain all on the active list until such time as the successive reductions of the length of service previous to promotion bring an excess in the grades of flag-officer, when retire such excess as before.

84. Of the other grades, down to and including the ensigns just graduated, until such time as the total numbers in these grades shall equal the proportion of the total personnel represented by the adopted ratios (Par. 40), distribute the actual number found in these grades in the proportion of the adopted ratios, that is 4 captains, 5 commanders, 13 lieutenant-commanders, 30 lieutenants, 12 lieutenants (junior grade), and 13 ensigns, always neglecting fractions and adjusting in the grade of ensign; but as the proportion of the large classes now graduating to the rest of the list would cause the service of ensigns to be temporarily

very much reduced below the normal 3 years that has been adopted for this grade (Par. 40), there should be established a minimum service of 2 years as ensign. Such minimum service is necessary to give these officers a suitable experience in the duties of the lowest grade, and also to prevent too frequent changes of the lowest grade, and also to prevent too frequent changes in the details for ships. In making these adjustments no officer now on the list should be reduced in rank or have his promotion unduly delayed. To this end the present authorized numbers in the grades should not be diminished. In the course of two or three years the new ratios will overtake the present numbers, after which there will be no further difficulty.

85. The gradual reduction of the length of service previous to promotion to rear-admiral will entail a corresponding gradual reduction of the length of service previous to reaching all the lower grades. If at the end of the period required to reduce the service of rear-admirals to 39 years, it should be found that the adopted length of service had not been reached for the other grades, then the same method could be applied to them successively; that is a reduction of the previous length of service by one year for each succeeding year. But it will be found that this procedure will not be necessary, as the limit will have been practically reached for the other grades by the time it will be reached for admirals.

86. The limit of previous service having been reached for the various grades by the gradual reduction of the limit for admirals, so soon as the increasing size of the navy list causes the service of captains, commanders, and lieutenant-commanders again to exceed the established limit, that is 30 years for captains, 25 years for commanders, and 19 years for lieutenant-commanders (Par. 40), then the promotions are to be made at the conclusion of such service, and the excess over the adopted percentages of the whole, that is 4 per cent for captains, 5 per cent for commanders, and 13 per cent for lieutenant-commanders (Par. 40), set aside for the reserve list, according to the provisions of Par. 61.

87. In the grades of lieutenant, lieutenant (junior grade), and ensign, in which there is no reserve list, the numbers should then be arranged in the proportion of 30 lieutenants to 12 lieutenants (junior grade) to 13 ensigns (Par. 40), always neglecting fractions and adjusting in the grade of ensign, unless such arrange-

ment fails to cause promotion to lieutenant after 10 years' service and to lieutenant (junior grade) after 7 years' service, in which case the promotions should be made after such adopted previous service, notwithstanding the resulting relative numbers in the grades. Also, as provided in Par. 84, the minimum service of ensigns should be 2 years, likewise without regard to the resulting numbers in the grades.

88. Entries should be made to the Naval Academy betweeen the ages of 15 and 17 years, in accordance with the provisions of Par. 76, but until the date of the expiration of the provisions of the Act of March 3, 1903, that is, June 30, 1913, the appointments should be made in rotation in such numbers as to keep the total number at the Academy the same as at present, that is a double representation from all the nominating powers, provided that the full strength of personnel, including midshipmen, 3 per 1000 tons of shipping, is not reached before said expiration on June 30, 1913, in which case, or on said expiration, entries should be made each year between the limits of 5 and 9 per cent of the total personnel, as provided in Par. 76.

89. Hence, to summarize; the only temporary modifications required while putting the plan in operation are as follows: (*a*) reduce the previous service of rear-admirals a year only each year until 39 years shall be reached; (*b*) arrange the numbers in the grades below flag rank in the proportion of the adopted ratios until such time as these grades shall reach full strength; (*c*) retain the present numbers in the grades until the proportions as above exceed these numbers; (*d*) make the minimum service of ensigns 2 years. No other modifications will be required, and those that are required are few and entirely devoid of complications.

90. In order to judge of the working of the plan here proposed, it will be desirable to apply it as nearly as possible to the actual navy list for several years to come, say to 1913, the date of expiration of the present law for the entry of midshipmen. Two estimates will have to be made, one the successive casualties in the navy list, the other the total tons of shipping for the years considered. For the casualties it will be sufficient to take the previous average results of all the classes now on the navy list, that is, 3 per cent annually.

91. For the shipping, the Register of January, 1906, gave a

total of 946,000 tons. The average increase for the preceding four years (see Par. 46) had been 49,000 tons annually. Suppose this rate to be maintained as far as new constructions are concerned, it will soon be necessary to make an allowance for annual deterioration. The life of various types of ships has been put at figures ranging from 15 to 25 or 30 years. Adopting 25 years as a fair average, then in a navy kept at nearly uniform strength, the loss would be 4 per cent annually (100 per cent in 25 years). This would mean at present about 40,000 tons annually. Hence with 50,000 tons new constructions, the annual gain would be 10,000 tons. So, for the years to be considered, the total tons and total personnel would be as follows:

	Tons.	Personnel.
1906	946,000	2,838
1907	956,000	2,868
1908	966,000	2,898
1909	976,000	2,928
1910	986,000	2,958
1911	996,000	2,988
1912	1,006,000	3,018
1913	1,016,000	3,048

The above figures are taken for January instead of the previous July, as per the plan recommended; but as the navy bill is seldom voted between July and January, the figures would be practically the same.

92. The number of Senators, Representatives, and Delegates, as per the Congressional Directory of April, 1906 (subject to modification by the subsequent admission of Oklahoma as a State), was as follows:

Senators	90
Representatives	386
Delegates	4
Total	480
Add District of Columbia	1
Porto Rico	1
At large (same proportion as West Point)	40
Total	522

As there will be for the years to be considered a double representative at the Naval Academy, the total allowance (double the above) will be 1044. This number is to be maintained, unless in the meantime the total personnel, including midshipmen, reaches the full strength of 3 per 1000 tons.

93. In constructing the succeeding tables, giving the estimated strength of the various precedence dates until June 30, 1913, the following points have been considered: the extra numbers have been omitted; the actual age retirements for the period have been taken into account; the precedence dates have been reduced 3 per cent annually; the selections out for the retired list from the rear-admirals of the lower half have been taken as nearly as possibly in proportion to the strength of the different dates concerned; 8 ensigns have been assumed to be appointed each year from the ranks (the law allows 12, but so far the full number has not been reached); and the midshipmen have been taken in sufficient numbers to fill vacancies, suffering each year percentage losses in accordance with Par. 39. The results are shown in Tables D to J inclusive, which are the application of the method to the navy list for the years 1907 to 1913 inclusive.

94. Table D is the application to the list of July 1, 1907. At present, July, 1906, the precedence date of '62 is reaching the grade of rear-admiral. Next year the date of '63 will be coming up. Hence, as decided, this date and the date of '64 will both be promoted, and the total previous service will be reduced from 44 to 43 years. It must come down eventually to 39 years, which will therefore be reached in 1911. As the proper total strength (Par. 91) is 2868, there will be 28 flag-officers (1 per cent, neglecting fractions). Of these 28, one-fifth, or 5 (neglecting fractions) will be vice-admirals; one-half the remainder, or 11 (neglecting fractions), will be rear-admirals of the upper half; and the remaining 12 will be rear-admirals of the lower half. From the table it will be seen that there will be 48 flag-officers in all of the date of '64 and senior; hence 20 of these must be retired. The President would select the 5 vice-admirals, and the first board would preferably be constituted from these. They would select from the rear-admirals of the lower half 20 for retirement, provided always there were not that many acceptable voluntary applicants. The junior rear-admiral, as may be seen from the Register, would have had about 3 years' service as captain, and would be 59 years old, counting 16 as the age of entry. This age of entry, 16, has been assumed in all the tables, though there have been times when it was not correct.

95. The other grades are manifestly short of the full allowance. The total percentage from captain down to ensign, inclusive

(Par. 40), is 77. 77 per cent of 2868 is 2210, and there are only 1291 available for these grades. Hence this last number is distributed in the proportion of 4 captains, 5 commanders, 13 lieutenant-commanders, 30 lieutenants, 12 lieutenants (junior grade), and 13 ensigns, always neglecting fractions and adjusting in the grade of ensign. The resulting numbers are shown in the table. As the captains and commanders would be short of the present authorized strength of 70 and 112 respectively, these numbers are retained. The junior captain will have had 37.3 years total service (as against 39 this year), of which about 4 as commander, and will be 53 to 54 years of age. The junior commander will be about 46, the junior lieutenant-commander about 38, and the junior lieutenant about 22. As the resulting service of the ensigns would be short of the minimum of 2 years, they are not promoted until such 2 years are completed, notwithstanding the fact that the number in the grade thus becomes greater than the proper proportion would demand. For the same reason the lieutenants (junior grade) will be correspondingly short. These inequalities will slowly disappear. It may be remarked that the fractions of years at the time of promotion are not strictly correct. The fractions are really the fractions of classes, all of which are promoted at the end of the year; but during the year the promotions are only in accordance with the naturally occurring vacancies. The three upper classes of midshipmen are the properly reduced numbers of the previous year; the fourth class is of the necessary strength to bring the total up to the double representation of 1044, which total must obtain until 1913, unless the normal full strength of the whole list is reached previous to that time. The total list, including midshipmen, will be 505 short.

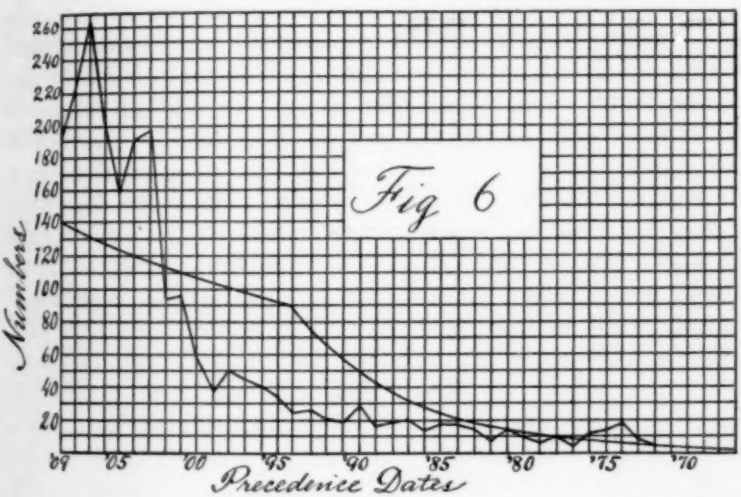
96. The tables for the succeeding years are exactly similar. The length of service prior to promotion to captain and commander decreases slowly each year. So it does for lieutenant-commander, except that in 1912 the bottom has about been reached and the length of service begins to increase. The same is true of lieutenants, except that the bottom is reached in 1908. and a slow rise begins. The 2 years' minimum service of ensigns obtains until 1913 and is then about to become inoperative. See the position of the dotted line in the grade of ensign, where the ratio alone would bring promotion. In 1911 the flag officers have

come down to the required 39 years' previous service; the excess of captains and commanders under the present law has disappeared; and moreover the total strength, including midshipmen, is now normal. But, on account of the large proportion at the Naval Academy, about 35 per cent instead of the normal 22 per cent, the numbers in the grades below flag rank are still materially short. The junior captain has 30.5 years' service instead of the required 30 (Par. 40), the junior commander 22.7 years' service instead of 25 normal, the junior lieutenant-commander 12.9 years' service instead of 19 normal, the junior lieutenant 6.8 years' service instead of 10 normal, and the junior lieutenant (junior grade) 6 years' service instead of 7 normal. Thus it is seen that, by the reduction of the previous total service for flag rank by one year each year, when the limit of 39 years is reached, the other grades except captain have reached and passed below their limit. The captains lack 6 months, which is passed the following year. Hence, as was predicted, no special modification is required for any of these grades; the sole proviso of reducing gradually the previous service of flag-officers having answered for all the rest.

97. In the tables for 1912 and 1913, the total strength of personnel having been reached, the appointments to the Naval Academy have been reduced to the numbers required to maintain this strength. The number so appointed in 1912 is 191, which is 6.3 per cent of the whole; and the number appointed in 1913 is 170, which is 5.6 per cent of the whole; both thus falling within the 9 per cent and 5 per cent limits, as established in Par. 76.

98. Table J, for 1913, shows a slight increase of the length of service for promotion to lieutenant-commander and lieutenant, already referred to. It is evident that as the larger classes begin to make their way up the list, promotions will become more and more nearly normal; but it will be 15 or 20 years from now before there will be any excess of numbers in the upper grades. The first large class, precedence date of '01, reaches 19 years' service in 1920, and a few years thereafter there will be an excess in the grade of lieutenant-commander, which will be the beginning of the reserve list; provided always the navy remains stationary. In case it continues to increase, the reserve list will be still farther postponed. The average of the forced retirements in flag rank for the 7 years considered is seen to be 16 annually, certainly a

very moderate figure; and this has been sufficient to level every obstacle that now stands in the way of a satisfactory navy list. Moreover, with the precedence date of '74 promoted to flag rank in 1913, and '75 and '76 the two following years, there is no other even moderately large class until the precedence date of '01, 25 years later. Hence even the compulsory retirements of flag-officers will be insignificant after 1915, and thence until 1940. The cost of putting the system in operation is the pay of 16 retired rear-admirals a year for the next 9 years; such pay, in any one case, taking effect from 0 to 7 years earlier than by the operation of the age limit alone; and such cost should be set against the cost of the present personnel retirements, which would be dis-



continued. Some years after 1920, as has been seen, there will be the beginning of a reserve list, which will then have to be provided for. The dates previous to '01, having already been selected out to depletion by the operation of former short-sighted legislation, will be scarcely able to supply suitable numbers for the sea-going list alone.

99. The conditions of Table J, for 1913, are best shown by a diagram. In Fig. 6, the two curves show to the same scale, first the actual estimated list of 1913 (the irregular figure); second the adopted normal curves of this paper, from flag rank to ensign inclusive, with a total of 2378, which is the proper strength for 1913 (3048 less 22 per cent for the midshipmen at the Academy).

The irregular curve shows the last of the full classes, precedence dates of '73 to '76, just disappearing under the compulsory retirements in the grade of rear-admiral. Thence for a dozen or more years may be seen the results of discharging graduates of the Naval Academy under the impression that their services would not be needed.

100. Formerly there was a "hump," now happily disposed of; in the years to come there is to be a "trough"; and of the two, the latter is the more serious. A "hump" may always be trimmed as required, but there is no way to replenish a "trough." And singularly enough there is still a tendency to apply "hump" methods to the "trough." All the recent plans for promotion contemplate selecting out captains, commanders, and lieutenant-commanders. But if officers are selected out in these grades, which are already short, it makes it necessary to go still further down the list to fill them. The remedy is needed at the top, to reduce the age of admirals; and no other remedy is needed of what sort soever. If Fig. 6 shows any one thing conclusively, it is that the classes of length of service suitable for the grades below flag rank are, owing to the increase of the navy and the heedless act of 1882, already extravagantly depleted. From Table D it is seen that every officer, of precedence dates subsequent to '68, is from now on until he has completed the total service requisite to promotion to rear-admiral, urgently needed to fill the depleted numbers in the grades of captain, commander, and lieutenant-commander. Without criticising the past results of the "Personnel Law," it should be terminated at once. The only part of the list where there is an excess is among the officers suitable for flag rank, and the "Personnel Law" scarcely touches them at all, but removes officers from a part of the list already short; in other words applies "hump" methods to the "trough."

STAFF CORPS AND ENLISTED FORCE.

101. The line is only a part of the navy personnel. There are the other corps of officers, the warrant officers and the enlisted men. Fortunately the questions, as far as they are concerned, are much less complicated. For the staff corps and warrant officers all that will be required will be to ascertain the ratio of total numbers to tons of shipping, and the relative numbers in the grades. This could be done by a suitable board. There are

no questions of reserve list and selection out. These matters once settled, entry and promotion become automatic.

102. As far as the men are concerned, the only question is the ratio of the total number to the total tons of shipping. In a paper of four years ago, with the data then at hand, the writer arrived at the ratio of 60 per 1000 tons, or 20 men per officer. In the House Report on the current Naval Appropriation Bill, the numbers estimated for 1908 are 59,874. The total of the present authorized shipping, which includes the ships of the House estimate, is 946,000 tons. The ratio then is 63 per 1000 tons. The table accompanying the House Report gives the ratios in foreign services as varying from 50 to 75. Hence it will be entirely reasonable to adopt 60 as the authorized ratio. At this ratio the present strength should be 56,760. It is actually 37,000. The law should allow enlistments *as necessary*, with 60 per 1000 tons as the limit.

PROPOSED BILL.

103. A bill incorporating the features that have been here discussed should include the following:

Sec. 1. The Navy Personnel shall be based on the serviceable tonnage. As soon as possible after the beginning of each fiscal year the Secretary of the Navy shall cause to be ascertained by the Board on Construction of the Navy Department the total displacement tonnage of the serviceable shipping built, and the shipping building and authorized, on the first day of the current fiscal year. Such total figure, approved by the Secretary, shall be transmitted to Congress with the estimates for the ensuing fiscal year, and shall form the basis for the determination of the Personnel for said ensuing year.

Sec. 2. The limit of the enlisted Personnel shall be determined on the basis of sixty (60) men for every one thousand (1000) tons of shipping as above established. The Secretary shall indicate in his estimates the actual numbers that will be required for the year in question, not to exceed the limit as above. These numbers shall be distributed in such ratings as the Secretary may determine with the approval of the President.

Sec. 3. The active Line of the Navy, including the Midshipmen at the Naval Academy, shall comprise three (3) Officers and Midshipmen for every one thousand (1000) tons of shipping as above established.

Sec. 4. The Medical Corps (Pay Corps, Chaplains, Professors of Mathematics, Naval Constructors, Civil Engineers, Boatswains, Gunners, Carpenters, Sailmakers, Warrant Machinists, Pharmacists, Electricians, Mates) shall comprise ..... officers for every one thousand (1000) tons of shipping as above established.

Sec. 5. The active Line of the Navy shall consist of one (1) Admiral of the Navy (becomes extinct with present incumbent) and of a suitable number of Vice-Admirals, Rear-Admirals, Captains, Commanders, Lieutenant-Commanders, Lieutenants, Lieutenants (Junior Grade), Ensigns, and Midshipmen. Of the total strength of the Line, one (1) per cent shall be Flag-Officers, four (4) per cent shall be Captains, five (5) per cent shall be Commanders, thirteen (13) per cent shall be Lieutenant-Commanders, thirty (30) per cent shall be Lieutenants, twelve (12) per cent shall be Lieutenants (Junior Grade), approximately thirteen (13) per cent shall be Ensigns, and approximately twenty two (22) per cent shall be Midshipmen. In calculating the above percentages, fractions shall be neglected and the adjustment made in the grades of Ensign and Midshipmen.

Sec. 6. The course at the Naval Academy shall be four (4) years, and Midshipmen on graduation shall be commissioned Ensigns. Ensigns shall serve as such not less than two (2) years, after which they may be promoted to fill a vacancy. They shall be promoted in any event after seven (7) years' total service. Lieutenants (Junior Grade) may be promoted at any time to fill a vacancy and shall be promoted after ten (10) years' total service. Lieutenants may be promoted at any time to fill a vacancy and shall be promoted after nineteen (19) years' total service. Lieutenant-Commanders may be promoted at any time to fill a vacancy and shall be promoted after twenty-five (25) years' total service. Commanders may be promoted at any time to fill a vacancy and shall be promoted after thirty (30) years' total service. Captains may be promoted at any time to fill a vacancy and shall be promoted after thirty-nine (39) years' total service.

Sec. 7. The above-described promotions, other than those necessary to fill vacancies, shall be made on the first day of each fiscal year, and the total service shall count from July 1 of the year of the precedence date to which the officer then belongs. The numbers in the various grades determined by the above percentages, or by promotions after completion of the required total

length of service, shall obtain for one year; and vacancies occurring during the year shall be filled in order of seniority from the grade below.

Sec. 8. The provisions of this law shall be put in effect gradually in the following manner: The total tonnage for the beginning of the actual fiscal year shall be ascertained in the manner provided in Sec. 1. Using such total tonnage as a basis to determine the proper total strength of the Line, one (1) per cent of which as provided in Sec. 5 are to be flag-officers, on July 1 following the passage of the act, the two precedence dates having respectively forty-four (44) and forty-three (43) years' total service, if not already promoted, shall be promoted to Rear-Admiral; the following year the two dates having forty-three (43) and forty-two (42) years' total service shall be so promoted; and so on, promoting two dates each year, until the date having thirty-nine (39) years' total service shall be reached and promoted. Until such time as the total of the grades below flag rank, exclusive of the Midshipmen, shall reach the full authorized strength, the total of these grades shall be arranged in the proportion of the adopted percentages; that is, in the proportion of four (4) Captains to five (5) Commanders to thirteen (13) Lieutenant-Commanders to thirty (30) Lieutenants to twelve (12) Lieutenants (Junior Grade) to thirteen (13) Ensigns, neglecting fractions and adjusting in the grade of Ensign; except that Ensigns shall serve not less than two (2) years as such prior to promotion, as provided in Sec. 6; and the authorized strength of any of the grades at the date of passage of this act shall not be reduced.

Sec. 9. Of the total authorized number of Flag-Officers; one-fifth (1/5), neglecting fractions, shall be Vice-Admirals; one-half (½) the remainder, neglecting fractions, shall be Rear-Admirals of the Upper Half; and the rest shall be Rear-Admirals of the Lower Half. The President shall appoint the Vice-Admirals, by and with the advice and consent of the Senate, from Rear-Admirals who have served at least one (1) year in command of a fleet, squadron, or division.

Sec. 10. When in June of any year the total number of Flag-Officers that will result after the ensuing July 1 promotions gives promise of exceeding one (1) per cent of the full authorized strength of the Line, a Board shall be formed of not less than

three (3) Vice-Admirals and Rear-Admirals of the Upper Half, who, considering only the best interests of the service, shall recommend for retirement in order of rank a sufficient number of Rear-Admirals of the Lower Half, and Captains about to be promoted to the grade of Rear-Admiral, to reduce the total number of Flag-Officers on July 1, after the promotions shall have been made, to one (1) per cent of the full authorized strength of the Line. Rear-Admirals of the Lower Half and Captains about to be promoted may volunteer for retirement in order to reduce the excess of numbers as above; and such applications shall be accepted after the promotions of July 1, at the discretion of the President for the best good of the service, not to exceed the number required. In case there should not be enough voluntary applications, or enough acceptances by the President, the remaining number required shall be taken in order of rank from the officers recommended as above by the Board.

Sec. 11. When in June of any year the total numbers of Captains, Commanders, and Lieutenant-Commanders that will result after the ensuing July 1 promotions give promise of exceeding four (4) per cent, five (5) per cent, and thirteen (13) per cent, respectively, of the full authorized strength of the Line, a Board shall be formed of not less than five (5) Rear-Admirals, who, considering only the best interests of the service, shall recommend for entry to a Reserve List for shore duty only, except in time of war, a sufficient number of Captains, Commanders, and Lieutenant-Commanders respectively, or officers about to be promoted to these grades respectively, to reduce the total numbers of Captains, Commanders, and Lieutenant-Commanders, on July 1, after the promotions shall have been made, to four (4) per cent, five (5) per cent, and thirteen (13) per cent, respectively, of the full authorized strength of the Line. Captains, Commanders, and Lieutenant-Commanders, and officers about to be promoted to these grades, respectively, may volunteer for entry to the Reserve List in order to reduce the excess of numbers as above; and such applications shall be accepted after the promotions of July 1, at the discretion of the President for the best good of the service, not to exceed the numbers required. In case there should not be enough voluntary applications, or enough acceptances by the President, the remaining number required in each grade shall be taken in order of rank in that grade from the officers recommended as above by the Board.

Sec. 12. All officers of the Navy, including the Reserve List of the Line, shall be allowed to volunteer for retirement on three-quarters pay after thirty (30) years' service, such applications to be accepted at the discretion of the President for the best good of the service. The age for compulsory retirement for all officers of the Navy, except Vice-Admirals, shall remain at sixty-two (62) years. Vice-Admirals shall be allowed to retire at sixty-two (62) years on their own application, and the age of compulsory retirement for Vice-Admirals shall be sixty-five (65) years.

Sec. 13. Midshipmen shall be appointed to the Naval Academy in such numbers as may be necessary to maintain the Line of the Navy at its full authorized strength and shall be between the ages of fifteen (15) and seventeen (17) years on July 1 of the year of entry. In putting in effect the new ages of entry, the change from the present limits shall be made gradually as follows: for the current year the upper limit shall remain at twenty (20); thereafter it shall be reduced to nineteen (19) the first year, to eighteen (18) the second year, and to seventeen (17) the third year; the lower limit shall remain at sixteen (16) for the current year and the first year thereafter, and on the second year thereafter it shall be reduced to fifteen (15). The appointments shall be in the proportion of one (1) for each Senator, Representative, and Delegate, in Congress, one (1) for Porto Rico, one (1) for the District of Columbia, and forty (40) at large. Until the expiration of the present law regulating appointments (Act of March 3, 1903), which is June 30, 1913; or until the Line of the Navy shall reach its full authorized strength, the total numbers at the Naval Academy shall be double the above proportions. Subsequent to June 30, 1913, or to the time when the Line of the Navy shall reach its full authorized strength, the size of the entering class shall be the number required to complete the full authorized strength of the Line, but shall not be less than five (5) per cent nor more than nine (9) per cent of such authorized strength.

Sec. 14. From the year following the passage of this act appointments shall be made in rotation on nominations by the various Senators, Representatives, and Delegates, the Governor of Porto Rico, and the President, in such manner as to equalize as nearly as possible all the States, Districts, and Territories, in each entering class. The original order of rotation shall be de-

termined by a consideration of the numbers and dates of recent appointments from all sources, and once established shall not be varied. Failures of candidates at the several preliminary entrance examinations may be made good by new nominations from the same source, but failures after the final entrance examinations of the year, or the death, resignation, or dismissal of any appointee at any time during his naval career, at the Naval Academy or later, shall not be credited as a vacancy to the United States at large, or the State, Territory, or District, from which such appointment was originally made; but shall be filled with other vacancies of the year in question by appointments in rotation as above provided. The designations already made for the current year on the passage of this act shall hold, but if possible the Secretary shall cause enough additional nominations to be made to fill all prospective vacancies.

Sec. 15. Hereafter the Secretary of the Navy shall cause to be distributed to all Senators, Representatives, Delegates, the Governor of Porto Rico, and the President, as soon as possible after July 1 of each year, a list with the complete adopted order of rotation, the first nomination for the ensuing year to be numbered 1, and the others in rotation in numerical order through the whole list, without regard to the actual number of appointments to be made. Accompanying the list shall be a statement of the actual number of designations to be made for the ensuing year, and such actual number shall be the shortage existing in the Line on the first day of the current fiscal year, exclusive of the then entering class of midshipmen, assuming as the proper strength of the Line the number ascertained as per Secs. 1 and 3, such shortage to be increased in the proportion found necessary by experience to obtain a suitable number of qualified candidates for any given number of vacancies. The nominations in accordance with this list, and to the extent indicated, shall be made prior to the ensuing March 4, and if not so made shall be filled by the Secretary of the Navy from residents of the State, District, or Territory, in which the nomination is due, as now required by law. All of such designated candidates as may be found qualified at the ensuing examinations shall be admitted to the Naval Academy. The list for the following year shall begin in the same rotation next after the last designation of the current year.

Sec. 16. The Medical Corps shall consist of a suitable number of Medical Directors, Medical Inspectors, Surgeons, Passed Assistant Surgeons, and Assistant Surgeons. The full authorized strength of the Corps shall be divided among these grades in the proportion of — per cent of Medical Directors, — per cent of Medical Inspectors, — per cent of Surgeons, — per cent of Passed Assistant Surgeons, and approximately — per cent of Assistant Surgeons. In making these calculations, fractions shall be neglected and the numbers adjusted in the grade of Assistant Surgeon. The numbers so determined shall go into effect on July 1 of each year and hold for a year, but no officer shall be reduced in rank by any change in the established numbers in the grades. The entries in the grade of Assistant Surgeon shall be made each year in suitable numbers to preserve the full authorized strength of the Corps.

Sec. *17.* The Pay Corps (similar to the above, followed by similar sections for the other Staff Corps and the Warrant Officers).

Sec. 18. All acts and parts of acts, so far as they conflict with the provisions of this act, are hereby repealed.

TABLE A.

PERCENTAGE OF LOSSES TO JANUARY 1, 1906.

Entry.	Service since Graduation.	Graduating Strength.	Present Strength.	Present Per Cent.	Percentage Annual Loss.	Entry.	Service since Graduation.	Graduating Strength.	Present Strength.	Present Per Cent.	Percentage Annual Loss.
'01	0.5	111	111	100	0	'80	21.5	26	12	46	3.5
'00	1.5	65	63	97	2.0	'79	22.5	27	8	30	5.2
'99	2.5	45	42	93	2.9	'78	23.5	47	19	40	3.8
'98	3.5	57	53	93	2.1	'77	24.5	37	11	30	4.8
'97	4.5	63	53	84	3.8	'76	25.5	78	22	28	4.9
'96	5.5	57	51	89	2.1	'75	26.5	62	29	47	2.8
'95	6.5	50	40	80	3.4	'74	27.5	50	32	64	1.6
'94	7.5	37	30	81	2.8	'73	28.5	45	21	47	2.6
'93	8.5	43	33	77	3.0	'72	29.5	45	27	60	1.7
'92	9.5	35	27	77	2.7	'71	30.5	48	18	37	3.2
'91	10.5	35	25	71	3.2	'70	31.5	40	22	55	1.9
'90	11.5	42	37	88	1.1	'69	32.5	34	15	44	2.5
'89	12.5	34	25	74	2.4	'68	33.5	25	7	28	3.7
'88	13.5	28	22	79	1.7	'67	34.5	49	13	27	3.7
'87	14.5	30	26	87	1.2	'66	35.5	68	23	34	3.0
'86	15.5	25	17	68	2.5	'65	36.5	74	31	42	2.3
'85	16.5	26	22	85	1.0	'64	37.5	99	32	32	3.0
'84	17.5	28	20	71	1.9	'63	38.5	87	26	30	3.1
'83	18.5	26	19	73	1.7	'62	39.5	73	18	25	3.4
'82	19.5	16	8	50	3.5	'61	40.5	85	23	27	3.2
'81	20.5	25	19	76	1.3						

Average percentage annual loss 2.8.

TABLE B.

3 PER CENT ANNUAL LOSSES.

Service since Graduation.	Strength of Date.	Total Strength.	Service since Graduation.	Strength of Date.	Total Strength.
0	100	100	22	51	1,678
1	97	197	23	50	1,728
2	94	291	24	48	1,776
3	91	382	25	47	1,823
4	89	471	26	45	1,868
5	86	557	27	44	1,912
6	83	640	28	43	1,955
7	81	721	29	41	1,996
8	78	799	30	40	2,036
9	76	875	31	39	2,075
10	74	949	32	38	2,113
11	72	1,021	33	37	2,150
12	69	1,090	34	36	2,186
13	67	1,157	35	34	2,220
14	65	1,222	36	33	2,253
15	63	1,285	37	32	2,285
16	61	1,346	38	31	2,316
17	60	1,406	39	31	2,347
18	58	1,464	40	30	2,377
19	56	1,520	41	29	2,406
20	54	1,574	42	28	Retired for Age.
21	53	1,627			

TABLE C.

13¼ PER CENT ANNUAL LOSSES AFTER 15 YEARS' SERVICE.

Service since Graduation.	Strength of Date.	Total Strength.	Service since Graduation.	Strength of Date.	Total Strength.
15	63	63	26	13	390
16	55	118	27	11	401
17	48	166	28	10	411
18	41	207	29	9	420
19	36	243	30	8	428
20	31	274	31	7	435
21	27	301	32	6	431
22	23	324	33	5	446
23	20	344	34	4	450
24	18	362	35	4	To Flag Rank.
25	15	377			

FLAG RANK.

Service.	Strength.	Total.
35	4	4
36	4	8
37	3	11
38	3	14
39	2	16
40	2	18
41	2	20
42	1	Retired for Age.

TABLE D.

NAVY LIST OF JULY 1, 1907.

Total Tonnage 956,000; Proper Strength 2,868.

Precedence Dates.	Total Service.		Strength.		Total.
Flag-Officers, 28.					
'59	48	Av. Age.	1	To Retire	1
'60	47		2		3
'61	46		5		8
'62	45		10	4	14
'63	44		16	9	21
'64	43	59	14	7	28
Junior, 3 years as Captain.					
NOTE.—5 Vice-Admirals (one-fifth); 11 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half					
Captains, 70 (3 Over).					
'65	42		21		21
'66	41		12		33
'67	40		6		39
'68	39		7		46
'69	38		14		60
'70	37.3	53.3	10		70
Junior, 4 years as Commander.					
Commanders, 112 (29 Over).					
'70	37		4		74
'71	36		11		85
'72	35		23		108
'73	34		15		123
'74	33		22		145
'75	32		16		161
'76	31		14		175
'77	30		5		180
'78	29.8	45.8	2		182
Junior, 4 years as Lieut.-Comdr.					
Lieut.-Comdrs., 217.					
'78	29		9		191
'79	28		7		198
'80	27		11		209
'81	26		18		227
'82	25		7		234
'83	24		18		252

Proportions below Flag.

Captains	(4/77)	67*	67
Commanders .	(5/77)	83*	150
Lt.-Comdrs. ..	(13/77)	217	367
Lieutenants ...	(30/77)	502	869
Lieuts. (Jun. Grade)	(12/77)	201	1,070
Ensigns	(13/77)	221	1,291

*Less than present numbers.

Precedence Dates.	Total Service.		Strength.	Total.
'84	23		19	271
'85	22		19	290
'86	21		15	305
'87	20		24	329
'88	19	Av. Age.	21	350
'89	18		20	370
'90	17.7	33.1	29	399
Lieutenants, 502.				
'90	17		5	404
'91	16		23	427
'92	15		26	453
'93	14		31	484
'94	13		29	513
'95	12		40	553
'96	11		49	602
'97	10		54	656
'98	9		60	716
'99	8		45	761
'00	7		68	829
'01	6.4	22.4	72	901
Lieuts. (Jun. Grade), 42 (159 Short).				
'01	6	22	42	943
Ensigns, 348 (127 Over).				
'02	5		112	1,055
'03	4.8		47	1,102
..	...	...	...	....
'03	4	20	189	1,291

NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.

Midshipmen, 1,044.			
'04	3	222	222
'05	2	190	412
'06	1	244	656
'07	0	16 388	1,044

Age of Entry, 15 to 17.

Summary.

Flag	28
Below Flag	1,291
Midshipmen	1,044
Total	2,363
Proper Strength	2,868
Short	505

TABLE E.

NAVY LIST OF JULY 1, 1908.

Total Tonnage 966,000; Proper Strength 2,898.

Precedence Dates.	Total Service.	Av. Age.	Strength.	To Retire.	Total.
		Flag-Officers, 28.			
'60	48		1		1
'61	47		1		2
'62	46		6		8
'63	45		7		15
'64	44		7	2	20
'65	43		20	15	25
'66	42	58	12	9	28
		Junior, 2 years as Captain.			
		NOTE.—5 Vice-Admirals (one-fifth); 11 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half.			
		Captains, 75.			
'67	41		6		6
'68	40		7		13
'69	39		14		27
'70	38		14		41
'71	37		11		52
'72	36		22		74
'73	35.9	51.9	1		75
		Junior, 3 years as Commander.			
		Commanders, 112 (18 Over).			
'73	35		14		89
'74	34		21		110
'75	33		16		126
'76	32		14		140
'77	31		5		145
'78	30		11		156
'79	29		7		163
'80	28		11		174
'81	27.3	43.3	13		187
		Junior, 4 years as Lieut.-Comdr.			
		Lieut.-Comdrs., 244.			
'81	27		5		192
'82	26		7		199
'83	25		18		217
'84	24		19		236
'85	23		19		255
'86	22		15		270
'87	21		23		293
'88	20		20		313
'89	19		20		333
'90	18		33		366
'91	17		22		388
'92	16		25		413
'93	15.4	31.4	18		431
		Lieutenants, 564.			
'93	15		12		443
'94	14		28		471
'95	13		39		510
'96	12		47		557
'97	11		52		609
'98	10		58		667
'99	9		44		711
'00	8		66		777
'01	7		111		888
'02	6	22	107		995
		Lieuts. (Jun. Grade), 2 (223 Short).			
'02	6	22	2		997
		Ensigns, 451 (205 Over).			
'03	5.3		223		1,220
..	...	...	...		....
'03	5		6		1,226
'04	4	20	222		1,448
		NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.			
		Midshipmen, 1,044.			
'05	3		178		178
'06	2		235		413
'07	1		313		726
'08	0	16	318		1,044
		Age of Entry, 15 to 17.			

Proportions below Flag.

Captains	(4/77)	75	75
Commanders .	(5/77)	94*	169
Lt.-Comdrs. ..	(13/77)	244	413
Lieutenants ...	(30/77)	564	977
Lieuts. (Jun. Grade)	(12/77)	225	1,202
Ensigns	(13/77)	246	1,448

* Less than present number.

Summary.

Flag	28
Below Flag	1,448
Midshipmen	1,044
Total	2,520
Proper Strength	2,898
Short	378

TABLE F.

NAVY LIST OF JULY 1, 1909.

Total Tonnage 976,000; Proper Strength 2,928.

Precedence Dates.	Total Service.		Strength.		Total.
Flag-Officers, 29.					
'62	47		2		2
'63	46		6		8
'64	45	Av. Age.	5	To Retire	13
'65	44		5		18
'66	43		3		21
'67	42		5	1	25
'68	41	57	6	2	29
Junior, 3 years as Captain.					
NOTE.—5 Vice-Admirals (one-fifth); 12 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half.					
Captains, 81.					
'69	40		14		14
'70	39		14		28
'71	38		11		39
'72	37		22		61
'73	36		14		75
'74	35.7	51.7	6		81
Junior, 4 years as Commander.					
Commanders, 112 (10 Over),					
'74	35		15		96
'75	34		15		111
'76	33		14		125
'77	32		5		130
'78	31		11		141
'79	30		6		147
'80	29		11		158
'81	28		17		175
'82	27		6		181
'83	26.7	42.7	12		193
Junior, 4 years as Lieut.-Comdr.					
Lieut.-Comdrs., 265.					
'83	26		5		198
'84	25		18		216
'85	24		18		234
'86	23		14		248
'87	22		23		271
'88	21		20		291
'89	20		19		310
'90	19		32		342
'91	18		22		364
'92	17		24		388
'93	16		29		417
'94	15		27		444
'95	14.6	30.6	14		458
Lieutenants, 612.					
'95	14		24		482
'96	13		46		528
'97	12		50		578
'98	11		57		635
'99	10		42		677
'00	9		64		741
'01	8		108		849
'02	7		106		955
'03	6.5	22.5	115		1,070
Lieuts. (Jun. Grade), 107 (137 Short).					
'03	6	22	107		1,177
Ensigns, 394 (127 Over).					
'04	5.4		137		1,314
..	...	...	...		....
'04	5		78		1,392
'05	4	20	179		1,571
NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.					
Midshipmen, 1,044.					
'06	3		220		220
'07	2		302		522
'08	1		256		778
'09	0	16	266		1,044
Age of Entry, 15 to 17.					

Proportions below Flag.

Captains	(4/77)	81	81
Commanders .	(5/77)	102*	183
Lt.-Comdrs. ..	(13/77)	265	448
Lieutenants ...	(30/77)	612	1,060
Lieuts. (Jun. Grade)	(12/77)	244	1,304
Ensigns	(13/77)	267	1,571

*Less than present number.

Summary.

Flag	29
Below Flag	1,571
Midshipmen	1,044
Total	2,644
Proper Strength	2,928
Short	284

TABLE G.

NAVY LIST OF JULY 1, 1910.

Total Tonnage 986,000; Proper Strength 2,958.

Precedence Dates.	Total Service.		Strength.		Total.
Flag-Officers, 29.					
'63	47		2		2
'64	46		1		3
'65	45		5		8
'66	44	Av. Age.	3	To Retire.	11
'67	43		4		15
'68	42		4	1	18
'69	41		13	8	23
'70	40	56	13	7	29
Junior, 3 years as Captain.					
NOTE.—5 Vice-Admirals (one-fifth); 12 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half.					
Captains, 89.					
'71	39		11		11
'72	38		21		32
'73	37		14		46
'74	36		20		66
'75	35		15		81
'76	34.4	50.4	8		89
Junior, 3 years as Commander.					
Commanders, 112 (1 Over).					
'76	34		5		94
'77	33		5		99
'78	32		11		110
'79	31		6		116
'80	30		11		127
'81	29		17		144
'82	28		6		150
'83	27		17		167
'84	26		17		184
'85	25	41	17		201
Junior, 5 years as Lieut.-Comdr.					
Lieut.-Comdrs., 290.					
'86	24		14		215
'87	23		22		237
'88	22		19		256

Precedence Dates.	Total Service.		Strength.	Total.
'89	21		18	274
'90	20		31	305
'91	19		21	326
'92	18		24	350
'93	17		28	378
'94	16		26	404
'95	15	Av. Age.	37	441
'96	14		44	485
'97	13.9	29.9	6	491
Lieutenants, 669.				
'97	13		43	534
'98	12		55	589
'99	11		41	630
'00	10		62	692
'01	9		105	797
'02	8		103	900
'03	7		215	1,115
'04	6.8	22.8	45	1,160
Lieuts. (Jun. Grade), 164 (103 Short).				
'04	6	22	164	1,324
Ensigns, 394 (102 Over).				
'05	5.4		103	1,427
..	...	...	...	....
'05	5		71	1,498
'06	4	20	220	1,718
NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.				
Midshipmen, 1,044.				
'07	3		283	283
'08	2		248	531
'09	1		214	745
'10	0	16	299	1,044
Age of Entry, 15 to 17.				

Proportions below Flag.			
Captains	(4/77)	89	89
Commanders .	(5/77)	111*	200
Lt.-Comdrs. ..	(13/77)	290	490
Lieutenants ...	(30/77)	669	1,159
Lieuts. (Jun. Grade)	(12/77)	267	1,426
Ensigns	(13/77)	292	1,718

* Less than present number.

Summary.	
Flag	29
Below Flag	1,718
Midshipmen	1,044
Total	2,791
Proper Strength	2,958
Short	167

TABLE H.

NAVY LIST OF JULY 1, 1911.

Total Tonnage 996,000; Proper Strength 2,988.

Precedence Dates.	Total Service.		Strength.		Total.
Flag-Officers, 29.					
'64	47		0		0
'65	46		5		5
'66	45		3		8
'67	44		4		12
'68	43	Av. Age.	3	To Retire	15
'69	42		5	2	18
'70	41		6	3	21
'71	40		10	7	24
'72	39	55	20	15	29
Junior, 3 years as Captain.					
NOTE.—5 Vice-Admirals (one-fifth); 12 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half.					
Captains, 99.					
'73	38		14		14
'74	37		20		34
'75	36		14		48
'76	35		13		61
'77	34		4		65
'78	33		10		75
'79	32		6		81
'80	31		10		91
'81	30.5	46.5	8		99
Junior, 3 years as Commander.					
Commanders, 124.					
'81	30		8		107
'82	29		6		113
'83	28		16		129
'84	27		17		146
'85	26		17		163
'86	25		14		177
'87	24		21		198
'88	23		19		217
'89	22.7	38.7	6		223
Junior, 5 years as Lieut.-Comdr.					

Precedence Dates.	Total Service.		Strength.	Total.
Lieut.-Comdrs., 323.				
'89	22		12	235
'90	21		31	266
'91	20		20	286
'92	19		23	309
'93	18		27	336
'94	17		25	361
'95	16	Av. Age.	36	397
'96	15		43	440
'97	14		47	487
'98	13		53	540
'99	12.9	28.9	6	546
Lieutenants, 746.				
'99	12		34	580
'00	11		60	640
'01	10		102	742
'02	9		100	842
'03	8		208	1,050
'04	7		203	1,253
'05	6.8	22.8	39	1,292
Lieuts. (Jun. Grade), 130. (168 Short).				
'05	6	22	130	1,422
Ensigns, 493 (168 Over).				
'06	5.2		168	1,590
..	...	...	...	....
'06	5		45	1,635
'07	4	20	280	1,915
NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.				
Midshipmen, 1,044.				
'08	3		232	232
'09	2		206	438
'10	1		240	678
'11	0	16	366	1,044
Age of Entry, 15 to 17.				

Proportions below Flag.

Captains	(4/77)	99	99
Commanders .	(5/77)	124	223
Lt.-Comdrs. ..	(13/77)	323	546
Lieutenants ...	(30/77)	746	1,292
Lieuts. (Jun. Grade)	(12/77)	298	1,590
Ensigns	(13/77)	325	1,915

Summary.

Flag	29
Below Flag	1,915
Midshipmen	1,044
Total	2,998
Proper Strength	2,998

TABLE I.

NAVY LIST OF JULY 1, 1912.

Total Tonnage 1,006,000; Proper Strength 3,018.

Precedence Dates.	Total Service.	Strength. Av. Age.	Strength. To Retire.	Strength. Total.
Flag-Officers, 30.				
'65	47		1	1
'66	46		3	4
'67	45		2	6
'68	44		3	9
'69	43		3	12
'70	42		3	15
'71	41		3	18
'72	40		5	1 22
'73	39	55	13	5 30
Junior, 3 years as Captain.				
NOTE.—6 Vice-Admirals (one-fifth); 12 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half.				
Captains, 107.				
'74	38		19	19
'75	37		14	33
'76	36		12	45
'77	35		4	49
'78	34		10	59
'79	33		6	65
'80	32		10	75
'81	31		16	91
'82	30		6	97
'83	29.4	45.4	10	107
Junior, 3 years as Commander.				
Commanders, 134.				
'83	29		6	113
'84	28		16	129
'85	27		16	145
'86	26		13	158
'87	25		21	179
'88	24		18	197
'89	23		17	214
'90	22.9	38.9	27	241
Junior, 4 years as Lieut.-Comdr.				

Proportions below Flag.			
Captains	(4/77)	107	107
Commanders .	(5/77)	134	241
Lt.-Comdrs. ..	(13/77)	350	591
Lieutenants ..	(30/77)	809	1,400
Lieuts. (Jun. Grade)	(12/77)	323	1,723
Ensigns	(13/77)	355	2,078

Precedence Dates.	Total Service.	Strength. Av. Age.	Strength. Total.
Lieut.-Comdrs., 350.			
'90	22	3	244
'91	21	20	264
'92	20	22	286
'93	19	26	312
'94	18	25	337
'95	17	35	372
'96	16	42	414
'97	15	46	460
'98	14	52	512
'99	13	39	551
'00	12.3 28.3	40	591
Lieutenants, 809.			
'00	12	18	609
'01	11	99	708
'02	10	97	805
'03	9	202	1,007
'04	8	197	1,204
'05	7	164	1,368
'06	6.8 22.8	32	1,400
Lieuts. (Jun. Grade), 175 (148 Short).			
'06	6 22	175	1,575
Ensigns, 503 (148 Over).			
'07	5.5	148	1,723
...	... ...	...	....
'07	5	124	1,847
'08	4 20	231	2,078
NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.			
Midshipmen, 910.			
'09	3	193	193
'10	2	232	425
'11	1	294	719
'12	0 16	191	910
Age of Entry, 15 to 17.			

Summary.	
Flag	30
Below Flag	2,078
Midn., 3 Upper Classes ...	719
Total	2,827
Proper Strength	3,018
Midn., 4th Class	191
Percentage of Whole	63

TABLE J.

NAVY LIST OF JULY 1, 1913.

Total Tonnage 1,016,000; Proper Strength 3,048.

Precedence Dates.	Total Service.	Av. Age.	Strength.	To Retire.	Total.
Flag-Officers, 30.					
'66	47		2		2
'67	46		1		3
'68	45		3		6
'69	44		3		9
'70	43		3		12
'71	42		3		15
'72	41		4	1	18
'73	40		8	4	22
'74	39	55	18	10	30
Junior, 4 years as Captain.					
NOTE.—6 Vice-Admirals (one-fifth); 12 Rear-Admirals, Upper Half; 12 Rear-Admirals, Lower Half.					
Captains, 113.					
'75	38		14		14
'76	37		12		26
'77	36		4		30
'78	35		10		40
'79	34		6		46
'80	33		10		56
'81	32		15		71
'82	31		6		77
'83	30		15		92
'84	29		16		108
'85	28.7	44.7	5		113
Junior, 3 years as Commander.					
Commanders, 142.					
'85	28		11		124
'86	27		13		137
'87	26		20		157
'88	25		18		175
'89	24		17		192
'90	23		29		221
'91	22		19		240
'92	21.7	37.7	15		255
Junior, 5 years as Lieut.-Comdr.					

Precedence Dates.	Total Service.	Av. Age.	Strength.	Total.
Lieut.-Comdrs., 370.				
'92	21		6	261
'93	20		26	287
'94	19		24	311
'95	18		34	345
'96	17		40	385
'97	16		45	430
'98	15		50	480
'99	14		37	517
'00	13		57	574
'01	12.5	28.5	51	625
Lieutenants, 854.				
'01	12		45	670
'02	11		94	764
'03	10		196	960
'04	9		191	1,151
'05	8		159	1,310
'06	7.2	23.2	169	1,479
Lieuts. (Jun. Grade), 296. (45 Short).				
'06	7		32	1,511
'07	6	22	264	1,775
Ensigns, 418 (45 Over).				
'08	5.8		45	1,820
..	...	...	...	....
'08	5		179	1,999
'09	4	20	194	2,193
NOTE.—Minimum Service 2 yrs.: dotted line shows where Ratio in Grades would otherwise bring promotion.				
Midshipmen, 825.				
'10	3		217	217
'11	2		284	501
'12	1		154	655
'13	0	16	170	825
Age of Entry, 15 to 17.				

Proportions below Flag.

Captains	(4/77)	113	113
Commanders .	(5/77)	142	255
Lt.-Comdrs. ..	(13/77)	370	625
Lieutenants ...	(30/77)	854	1,479
Lieuts. (Jun. Grade)	(12/77)	341	1,820
Ensigns	(13/77)	373	2,193

Summary.

Flag	30
Below Flag	2,193
Midn., 3 Upper Classes ...	655
Total	2,878
Proper Strength	3,048
Midn., 4th Class	170
Percentage of Whole	5.6

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

AMERICAN NAVIGATORS OF THE COLONIAL PERIOD AND THE YANKEE MIDSHIPMAN.

By T. G. Ford.

While old England was exercising lordly control over the seas, there was growing up in the American Colonies a remarkable race of men, sprung from her loins, inheriting her seafaring aptitude, and destined one day to dispute her maritime supremacy. Long before the Revolutionary War, the natives of New England were famous for their skill as seamen, and hundreds of their sons, from choice and love of adventure, went to sea at a very early age. Indeed, to try one's fortune afloat was then considered a manly thing to do, and there was no lack of volunteers and apprentices sailing "before the mast," on board the swift London packets, or in the carrying trade to the West Indies. That many preferred the more perilous service in armed vessels is proven by the fact that about 12,000 American seamen of all ages enlisted in the King's ships and Colonial privateers during the Seven Years' War with France. Nor must we forget those who served in the Guarda-Costas, employed by the Colonies "for the suppression of piracies and the general protection of the coasts, which, operating inshore, were an excellent school of training for young seamen." Cooper tells us, in his "Naval History of the United States," that about 1750 "it became a practice among the gentry of the American provinces to cause their sons to be entered as midshipmen in the Royal Navy, and that occasionally an American had been transferred from the Colonial Marine to that of the King," but previous to that period "very few boys had been regularly entered or rated in the service with a view to adopting it as a profession." The inducements, moreover, were very great, as might be imagined. Indeed the frequent presence of British ships of war in the Colonial seaports, by their imposing size and armament and by the gilded

pomp and panoply of King George's Naval Service, must have proved a great attraction to the American-born youth, especially if he were the son of a Tory; but what enticed and decided him more than all else to enter the navy of the Mother Country was doubtless the jaunty appearance of the British midshipman as he swaggered through the streets of Boston or New York in his gilt-buttoned uniform and with a wicked looking dirk hanging from his belt. It was as difficult for an impressionable youth to resist such an influence as it was to look unmoved upon such dazzling structures as that described by Falconer in his "Ninety-gun Ship":

> With bulk immense, like Ætna she surveys
> Above the rest the lesser Cyclades:
> Profuse of gold, in lustre like the sun,
> Splendid with regal luxury she shone,
> Lavish in wealth, luxuriant in her pride,
> Behold the gilded mass exultant ride!

Of American-born youths who entered the English Navy as midshipmen previous to or during the Revolutionary War, and rose to high station and fame in the King's service, we find the following names: Jahleel Brenton, the first of his name in Rhode Island, reached the rank of rear-admiral; the fourth Jahleel Brenton, a lieutenant in 1776, refused an offer of high rank in the "Congress Navy," and reached the rank of post-captain at the Peace of 1783, with the loss of his estates in Rhode Island, which were confiscated;[1] the fifth Jahleel Brenton, also born in Rhode Island, received his midshipman's warrant in 1781, served in the *Queen*, commanded by his father, was sent to the Naval School at Chelsea after the Peace, and became Rear-Admiral of the Blue; Isaac Coffin, of Boston, served as a midshipman on the American station, as it was then called, in 1773-6, and in due time became Admiral Sir Isaac Coffin, with a reputation second to none in the naval history of his time;[2] Benjamin

[1] His second son, Edward Pelham Brenton, a post-captain, wrote the "Naval History of Great Britain from 1783 to 1822," and a "Biography of Admiral Earl St. Vincent." Another son in the Royal Navy was killed while performing a daring exploit under Nelson in the Mediterranean.

[2] This veteran officer died in 1838 at his seat in New Brunswick, Nova Scotia, in the 87th year of his age. He always boasted of being Boston-born, and never lost his interest in the "Old Thirteen," as he called the American Colonies. His brother, John Coffin, fought with the English at Bunker Hill, which battle the admiral looked upon "as the event which controlled everything that followed in the War of the Revolution."

Hallowell, born in Boston in 1761, was a midshipman and lieutenant on the North American Station during the war, served in Hood's fleet in the action with De Grasse in Basseterre Roads (1782), was a volunteer in the *Victory* at the battle of Cape St. Vincent (1797), commanded the *Swiftsure*, 74, in Nelson's squadron at Aboukir Bay (1798), and greatly contributed to that victory, which made him Rear-Admiral Sir Benjamin Hallowell;[3] Ralph Willet Miller, of New York, served as a midshipman on the North American Station during the war, commanded Nelson's ship, the *Captain*, at Cape St. Vincent, and the frigate *Theseus*, at the Nile, and was killed in that ship at the siege of St. Jean d'Acre (1799); Francis Laforey, of Virginia, was a midshipman during the war, and commanded the *Spartiate*, 74, at Trafalgar; Israel Pellew, of Maryland, served in the frigate *Flora* during a part of the war, and became an admiral;[4] John Skinner, of New Jersey, was a midshipman during the war, and lost an arm in an affair with some Whig batteries on the Hudson River; Robert Winthrop, of Connecticut, was a midshipman during the war, and rose to be vice-admiral in 1830.

These, and other American youths whose names we are unable to give—mainly the sons of Loyalists—remained in the British Navy, and some of them, says Cooper, "obtained a painful notoriety by their activity against the land of their birth," which was regarded as an evidence "of the fidelity of a seaman to his flag."

Of the American youths who served in the British Navy pre-

[3] It was Sir Benjamin Hallowell—the intimate friend of Nelson—who presented to the latter a coffin made of a part of the mainmast of the French flagship *l'Orient*, captured at Aboukir Bay, so that he might have the pleasure of being buried in one of his trophies. Nelson highly appreciated the compliment, says his biographer, and had the coffin set up against the bulkhead of his cabin—on the *Vanguard*—and "viewed it with the undaunted mind of a warrior." Hallowell died in 1834, aged 73; in England. The father of Midshipman Hallowell, commissioner of customs at Boston, went to England in 1776. His estate at Jamaica Plain was confiscated, the house being used as a hospital for Colonial troops and the beautiful grounds as a cemetery. He died at York, Upper Canada, in 1799.

[4] The city of Annapolis stands upon a portion of Admiral Pellew's ancestral estate of 2000 acres. His brother Edward was also a naval officer and was engaged on the British side at the battle of Lake Champlain in 1814. He is known in English naval history as Lord Exmouth, "one of the most celebrated commanders of his time." He died in 1833, aged 76.

vious to 1776, and threw up their warrants in consequence of the impending war, we find the names of Richard Dale and Nicholas Biddle, born of patriot ancestry, the former of whom filled a short term of service in a British ship under peculiar circumstances related elsewhere, the latter a longer term. With a ruling passion for the sea, young Biddle sailed before the mast in a Yankee ship in his 13th year, and after having made several voyages he was sent to England with letters that procured for him a midshipman's warrant on board a sloop-of-war commanded by Captain Sterling. He subsequently (1773) joined the bomb-ketch, *Carcase,* Captain Lutwidge, one of two vessels dispatched to the Arctic Seas with instructions to ascertain how far navigation towards the North Pole was practicable. In this small craft he found Midshipman Horatio Nelson, who, like Biddle, had obtained permission to serve as a volunteer on the *Carcase,* in despite of the Admiralty's order against the admission of boys. Very soon, on account of their zeal and handiness as seamen, they were both appointed cockasterns (coxswains) by the commanding officer, a position then much coveted by ambitious midshipmen. From this humble beginning, each rapidly advanced in his profession—the one being destined to be blown up with his ship in the 24th year of his age, March, 1778, after a short but brilliant career in the Continental Navy, and the other to lose his life gloriously at Trafalgar (1805), at the close of one of the most brilliant naval victories recorded in history.

It is stated, too, that George Washington, during a visit in his fourteenth year to his elder brother, Lawrence, at Mount Vernon, met there English Army and Navy officers serving on ships of war lying in the Potomac, whose discussions of professional subjects inspired him with a desire to enter the King's Naval Service. This, says Irving, was easily arranged by Lawrence Washington,[8] with his friend Admiral Vernon, the mother's consent having been at first freely given, and the boy's baggage was actually put on board of one of the ships anchored near Mount Vernon. "But the mother's heart failed her, and at her urgent remonstrance, the nautical scheme was given up." Indeed it has been asserted that on account of her Tory inclinations, "it

[8] Lawrence Washington had served in the British land force under General Wentworth that besieged Cartagena. There he met Admiral Vernon, who commanded the fleet on that occasion and whom he esteemed so highly that he gave his name to the family estate on the Potomac.

was in the beginning as grievous in her eyes to see her favorite son in the American Army, as it would have been to have seen him in King George's Navy, from entering which he had been dissuaded only by his appreciation of her devoted love."[6]

What might have happened had he been allowed to follow the sea as a profession, in the Continental Marine, it would be difficult to conjecture. What did happen upon the Declaration of Independence is familiar to every reader of American history. No more could any British ship-of-war, however dazzling or formidable, entice a patriotic American youth or seaman within her bulwarks. It was the hastily improvised and poorly equipped Congress ships[7] and privateers of 1776 that attracted all the young patriots desirous of serving their country on the sea.[8]

First among these with naval aspirations we find young Nicholas Biddle, already mentioned, who, anticipating the course of events, had turned his back upon all the allurements and prospective honors of the King's Navy, and hastened homeward in 1775 to share with his countrymen the dangers and honors of the Revolutionary War. He received a lieutenant's commission in 1776, and had command of the U. S. brig *Andrew Doria,* of 14 guns, in the first year of the war; in February, 1777, he was appointed to command the frigate *Randolph,* of 32 guns, was wounded in March, 1778, in an action with the *Yarmouth,* of 64 guns; and while in the hands of the surgeon was blown up by an explosion of the magazine of the *Randolph,* his whole ship's company, excepting four men, perishing with him.

Next we find Richard Dale, who had been an apprentice before

[6] See article in Harper's Magazine, Vol. 70, entitled "In an Old Virginia Town," by F. Daniel.

[7] Several of these "Congress Ships" were built of American live oak, from designs of John Peck, of Boston, the best shipbuilder of the day. They are said to have resembled the French and Spanish models more than the English, in their high poops, square sterns and ponderous quarter galleries, and were armed with 4, 6, 9 and 12 pounders. At that time, stout oak ships were built at Salem and Gloucester at a cost of $24 per ton, and live oak vessels at not more than $38 per ton, whereas nowhere in England, France or Holland, could a ship be made of oak for less than $50 per ton. "It was not strange, therefore, says John Fiske, that before the war more than a third of the tonnage afloat under the British flag was launched from American dock-yards."

[8] Not less than 4000 Yankee sailors, driven from their legitimate calling by the enemy's cruisers, had enlisted in the army before the Continental Navy was organized.

the mast at sea in his 12th year, and had served as mate, or in a position corresponding to that of midshipman, with James and Samuel Barron[9] as his messmates, in 1776, on board a Virginia State cruiser, commanded by the father of the latter, James Barron, who was grandiloquently styled "Commodore of all the armed vessels of the Commonwealth."[10] Dale's adventurous spirit soon led him into captivity at Norfolk, where some of his Royalist schoolmates induced him to join an English cruiser, in which he was wounded. But upon the Declaration of Independence, he entered the Continental Navy and was appointed midshipman on board the U. S. brig *Lexington,* 16 guns, which was captured by the British on the coast of France in 1777, and was taken to Plymouth, England, where the officers and crew were thrown into Mill Prison. In 1778, Dale and others escaped from prison but were recaptured and remained in durance vile until 1779, when Dale at last succeeded in eluding the vigilance of his jailors and hurried over to France to offer his services to John Paul Jones, who was then fitting out his little squadron at l'Orient. Dr. Franklin gave Dale an acting appointment as lieutenant, and he had the honor of serving under Jones as first lieutenant on the *Bon Homme Richard* in her terrible fight with the *Serapis.* In February, 1781, he was regularly commissioned as a lieutenant, and was taken prisoner for the third time, in the *Trumbull,* but was soon exchanged and served during the remainder of the war in letters of marque and merchantmen. Dr. Franklin, minister of the United States to France, had blank commissions to fill at his discretion, and he appointed Dale and other subordinate officers of Jones' squadron. His townsman, William Jones, entered as midshipman on board the letter of marque *St. James,* 20 guns, Captain Truxtun, and was promoted for bravery in the desperate defense of that vessel, against superior force, during a voyage to France. In 1813, being then in civil life, he became Secretary of the Navy.

We also find the name of Edward Preble, whose passion for the sea led him as a mere stripling into the merchant service, in which he diligently learned the seaman's art, until he received a

[9] These young officers commanded two vessels of Dale's squadron of observation in the Mediterranean in 1801.

[10] The Virginia Navy, so-called, of which hardly any mention is made in the histories of the period, was employed during the war chiefly for the defense of the bays and rivers of the State.

midshipman's warrant in 1779, on the Massachusetts State ship *Protector,* Captain Williams. He was present in her hard fought action with the privateer *General Duff,* and was afterward captured and confined on board the horrible prison-ship *Jersey,* in the harbor of New York. On being liberated he joined the Massachusetts ship *Winthrop* as first lieutenant, in which capacity, says one of his biographers, he distinguished himself "by boarding with fourteen men an English armed brig lying in the Penobscot River, and carrying her under fire of a shore battery."[11] This daring exploit made a hero of Preble, who was only twenty-two at the close of the war, and who commanded vessels in the merchant service for many years afterwards, until he was commissioned a lieutenant in the regular navy in 1799, with some other officers of the Revolutionary War.

Such were the young men of 1776 who chose the sea service as their profession. All were filled with martial ardor that nothing could restrain, but the most impetuous and daring were those who ran away from comfortable homes to embark in the dangerous work of privateering. It is worthy of notice, also, that a large share of this perilous work afloat was done by mere boys, whether sailing in privateers or "Congress Ships." We read of the privateer *Greyhound,* of 60 tons, having a crew of 20 boys and only a few able-bodied seamen, and of the *Ranger* and other Continental vessels, each having in her complement over 30 boys of all ages. Generally one of the boys was assigned to each gun to serve ammunition, and these were called "waiters;" others were stationed aloft in charge of the upper sails and rigging, or wherever they were needed. Not infrequently, says Goldsborough, in his "Naval Chronicle," young men without any sea training, but living in sight of the sea, combined to capture armed schooners of the enemy lying at anchor in or near some port. Joseph Wheaton, of New York, was one of the party of young men who, in a lumber sloop, captured the British armed schooner *Margaretta,* off the coast of Massachusetts, and to him belongs the honor of having in person taken the first flag of the enemy afloat. Such Nantucket boys as Baxter, Chase,[12] Coffin,

[11] Captain George S. Blake, in the American Cyclopædia.

[12] Reuben Chase was the hero of Cooper's Red Rover, under the name of Long Tom Coffin. He served under Paul Jones in the *Bon Homme Richard,* and it is said that his friendship with Franklin in Paris may have induced the latter to procure for Jones the command of the *Richard.*

Fitch, Folger, Gardner, Hussey, Grinnell, Pinkham, Rotch, West, Worth and others, who afterwards became "the most daring captains that ever trod a whaler's deck in the Arctic or Southern Seas," were foremost in every nautical project designed to cripple the enemy. At one time, not less than thirty masters of merchant vessels at Newburyport, unable to obtain commands, volunteered as sailors on the Boston ship *Vengeance,* and it is stated that young Nantucket captains were the first to practice marine telegraphy by means of the vanes attached to the windmills on high points near the town, which greatly annoyed the British naval officers in that vicinity. Boston, of course—the heart of the revolution—was represented ashore and afloat by a large number of her young sons, whose unconquerable spirit attracted the special attention of our gay French allies. All Americans, says Breck, were known in France at that time by the name of Bostonians,[13] whose valor was celebrated in a song then in fashion, the chorus of which was

> Bon, Bon, Bon,
> C'est à Boston
> Qu'on entend soufle (sic) les canons.

Both town and country boys took part in all these enterprises, sharing alike in the dangers and spoils of foray or battle. Many of them were captured with their vessels by British cruisers and spent weary months or years in foul prison-ships or fouler jails, such as Dartmoor in England, "their principal food there being 'brown George,' an unpalatable bread named after the King." Only a few, like Midshipman Dale and his comrades, succeeded by daring ventures in escaping from the horrors of such imprisonment—the other unfortunates while awaiting exchange or deliverance were occasionally assisted by wealthy American Loyalists, settled in England,[14] or made an honest penny by the sale

[13] Hence also the name of the game of cards (Boston) then introduced in the French coffee houses of that period.—Samuel Breck's Memoirs.

[14] A writer says, "Occasionally Admiral Sir Isaac Coffin, who never entirely forgot his native land, went down to Dartmoor to talk to his townsmen among the prisoners there. In fact, he found some relatives among them, and he offered to procure the release of all the Nantucket men (or Massachusetts men) provided they would settle on the island of Anticosti in the Gulf of St. Lawrence, which they declined to do, preferring to take their chances of exchange, and return to their own country. But it is quite likely that the honest old admiral often relieved the necessities of his townsmen by welcome gifts of money. The sufferings

of miniature sloops or ships of their own handiwork. Indeed we are told that one young fellow from Salem, singularly named John Deadman, spent twenty-two months of his imprisonment in building a three-decker four feet long, and completely rigged and armed, which sold for twenty pounds sterling to some curiosity hunter of nautical taste.[18] It appears, too, that some of the boys studied arithmetic and geometry in prison, hoping that one day they might be able to master the art of navigation and obtain a commission, and perhaps a command, in the Continental Navy.

This heterogeneous force, called the "Continental Navy," was organized, as far as was expedient, upon the British model, with its various grades of commissioned and warrant officers up to and including that of commodore, and thus it came to pass that the title and grade of midshipman were introduced into our naval service. Be it ever remembered, too, that this beginning of a nautical marine was mainly the work of John Adams (afterwards President of the United States), and not inappropriately called the "Father of the American Navy," who also drew up the first body of regulations, adopted for its government in November, 1775, which formed the basis of the Naval "Articles of War" of 1800. The existence of the American midshipman, therefore, dates back to the organization of the Continental Navy, and may be divided into two periods, the first embracing years of almost constant warfare, followed by a long interval of peace down to 1845, during which his professional standing depended almost entirely upon his own unaided exertions; the second, including two wars and many years of peace down to the present time, during which his careful education and training became the settled policy of the government.

It is our purpose to trace the history of the American midshipman in war and peace—a subject hitherto neglected—and to place on record the professional services both of the untaught

of the prisoners there were very great, as may be imagined, and culminated in an unwarrantable slaughter by the military guard under orders of Governor Shortland, an army officer, who suspected them of a design to escape. We can imagine how rejoiced they were when the treaty of peace was signed at Ghent. American flags that had been concealed upon the persons of some of the men were hoisted in the prison under a national salute of pop-guns by the prisoners, which greatly enraged the Governor.

[18] Memoirs of Andrew Sherburne, Utica, 1828.

or self-taught midshipman of the old school, and of the highly educated midshipmen of the new school. In the treatment of this subject, it will be necessary to touch lightly upon events in our naval history in which this class of young officers participated or were in some way concerned, and it will be seen that the humble midshipman of both schools has deserved so well of his country that never more can he be slighted or his services in battle be underrated or neglected by his commanding officers or by the naval chronicler. Perhaps, too, the midshipman of to-day and of the future may be incited to heroic deeds and noble impulses by the example of those who fought so heroically and bled so freely in the past naval wars of the Republic.[28]

On November 28, 1775, the "Rules for the Regulation of the Navy of the United Colonies" were agreed to in the Continental Congress, and the pay of officers fixed as follows: Captain, $32 per calendar month; lieutenants, $20; and among the allowances then prescribed was "half a pint of rum per man every day, and a discretionary allowance on extra duty and in time of engagement." This provision for fortifying the inner man in emergencies was in accordance with the spirit of the day, but there were no midshipmen as yet to partake of it. The first mention of midshipmen in the Revolutionary records is found in the resolution of the Continental Congress of December 9, 1775—"That the Marine Committee appointed to fit out armed vessels, be empowered to employ the following officers, and that their pay be as follows: Midshipmen, $12 per calendar month; sailmaker, $12 per calendar month; cook, $12 per calendar month."

By the Resolution of the Continental Congress of December 22, 1775, reserving to itself the appointment of all commissioned officers, the Marine Committee was authorized "to issue warrants to all officers employed in the fleet under the rank of third lieutenant," and it is presumed that many such warrants were actually issued to young lads entering the service as midshipmen. The next official reference to the grade is found in the resolution of prize money, to this effect: "That the following warrant and petty officers (allowing for each ship six midshipmen, for each brig four midshipmen, and for each sloop two midshipmen, &c.), have three-twentieth parts divided among them

[28] This was written long before the recent Spanish-American war, in which the junior grades of officers also distinguished themselves.

equally." This proportion, though small, must have filled their purses many times during the Revolutionary War, if we take into account the number of transports and prizes captured.[17] When Commodore Whipple's little squadron took ten prizes of the convoyed Jamaica fleet, in 1779, a midshipman of the *Ranger*, of 16 guns, upon a division of the spoils of one short cruise, received for his share a ton of sugar, 40 gallons of proof Jamaica rum, 20 pounds of cotton, about the same quantity of ginger, logwood and alspice, and a sum of 700 dollars in paper money, then equal to 100 dollars in specie. Such good fortune as this, occurring not infrequently, was as welcome to the old folks at home, who could make good use of the cotton, ginger, logwood and alspice, as it was inspiring to their precious boy at sea, who doubtless learned to keep an eye to the profits whilst chasing the enemy's richly laden vessels. It was not an uncommon thing for a Yankee sailor to get for his share of a prize vessel engaged in the West India trade, a stock of Manchester prints, Irish linens and silk stockings of the best quality, which he sold to friends at home at great bargains, after having fitted out his "Poll" with all that her heart could desire of the booty. So great a quantity of West India produce was brought into the United States by privateers, that Jamaica rum sold for 75 cents a gallon, and sugar at five dollars per hundred weight. Captain John Paul Jones captured the ship *Mellish*, from Liverpool with 10,000 sets of uniform for the British Army in Canada, but these were appropriated at once for clothing the ragged soldiers of our Revolutionary Army. These were halcyon days for the Continental cruisers, when officers and sailors were exalted not only by patriotism and prize money, but also by the daily pint of rum, a liberal daily allowance of grog, which even the smallest midshipman learned to imbibe without a grimace. This tipple, although slightly diluted with water according to the receipt of the British Admiral, Vernon, who was nicknamed "Old Grog," was evidently more inspiring than the wine which, perhaps for climatic reasons, was supplied to the British fleets on the North American Station at this period, otherwise it might be difficult

[17] Clark, in his Naval History of the United States, (1813), informs us that 342 ships of the enemy were taken in 1776, and 500 in the first eighteen months of the war, amounting to about 60,000 tons. The tonnage of American shipping (then comparatively small) taken by the English during the whole war amounted to only 57,000 tons.

to account for the success of the poorly equipped Yankee cruisers. But the Englishmen also had many successes and much prize money, the admiral's large share being generally paid in silver dollars, which were packed in chests and sent home in that bulky form instead of in bills of exchange on London. It is related of old Admiral Clark Gayton, that when he was told that his flag-ship, the *Antelope* (in which he was about to return to England with his treasure), was so crazy that she would probably founder on the passage, he replied gruffly: "My money and myself will take our passage in the same bottom, and if we are lost there will be an end to two bad things at once." The doughty Admiral, however, was lucky enough to reach England, where he enjoyed his professional honors and hard-won prize money in peace and contentment.

We have seen that the pay of midshipmen was fixed in November, 1775, at $12 per calendar month, which was the precise allowance made to the ship's cook. They had the distinction, however, of being the only grade of officers whose pay did not vary according to the rate of the vessel in which they served. We are unable to say if there was any significance in placing the midshipman in the pay-table of November 15, 1776, between the surgeon and gunner—probably they would have felt more at home between the purser and boatswain, from whom they received monthly financial comfort and daily practical aid in "learning the ropes." However this may be, it cannot be doubted that the midshipman of the Revolution was a dazzling creature if he ever wore the first Continental uniform prescribed for his grade by the regulations of the Marine Committee of 1776, at Philadelphia, which consisted of a blue lapelled coat with stand-up collar, round cuffs faced with red, buttons and button-holes red, blue breeches and red waistcoat. No mention is made of the headgear, but it was probably in harmony with this fiery uniform, indicative perhaps of the bloody struggle then commenced, and far eclipsing the uniform of King George's reefers. Whoever has witnessed the effect upon susceptible young maidens of the naval cadet of our day in his simple blue blouse or jacket, adorned only with black braid, gilt buttons and silver anchors, can easily imagine the havoc among the high-spirited, patriotic girls of the colonial seaports caused by the midshipman's uniform of 1776. The typical British jacket, if then worn by the King's reefers, was not

adopted for Yankee midshipmen perhaps because of the prevailing opposition to *half* measures of any sort. It was going to be a fight to the death with the old monarchy of England, and although the wise men of the Marine Committee did not hesitate to introduce into the Continental Navy all the desirable feaures of the enemy's naval service, they drew the line of similarity at the jacket, believing probably that the stalwart Yankee midshipman, developing rapidly by revolutionary impulses, could not do himself justice at sea in any such abbreviated garment. Moreover it was possible then, as it is now, to belittle an aspiring youth as well as a full grown man by clothing him incongruously. But, whatever the reason for discarding the jacket, it is certain that the revolutionary midshipman wore a long-tailed coat, and it was not until after the War of 1812, when perhaps the average stature of this class of officers had become reduced by the enervating efforts of peace, that the famous blue jacket was first seen in the steerage of our men-of-war.

The uniform prescribed for captains of the revolutionary period was a blue cloth coat, with red lappels, slashed cuffs, stand-up collar, and flat yellow buttons, blue breeches and red waistcoat with yellow lace. This uniform, perhaps on account of its glaring colors, was modified in 1777 by agreement among the naval captains of Boston, but the dashing John Paul Jones would be satisfied with nothing less than gold-bound button holes, gold epaulets and a chapeau in the French style, and he dressed his marines on board the *Alliance* in red and white instead of the prescribed green color. It was, perhaps, a growing tendency on the part of individual captains to indulge in eccentricities of uniform that brought about the pointed Resolution of Congress of February 28, 1781, "That after the first day of January next, no officer whatsoever in the service of the United States shall in any of them wear on his clothes any gold or silver lace, embroidery or vellum, other than such as Congress or the commander-in-chief of the army or navy shall direct for the uniform of the corps, and badges to distinguished officers."[1]

Owing to the loose methods of appointing officers in the Continental Navy by Congress, the Marine Committee, the commanders of ships and squadrons, and the diplomatic agents of the government abroad, and to the destruction by fire and neglect

[1] Secret Journals of Continental Congress, 1781.

of many official records of war, there have come to us only imperfect lists even of the captains, commanders and lieutenants of that period. As early as October 28, 1779, Congress directed the Board of Admiralty, which succeeded the Marine Committee, "to keep an annual register of the names of all officers of the Navy with their rank and the dates of their commissions." By a subsequent Resolution of February 7, 1781, it was made incumbent upon the Secretary of Marine "to make a register of the officers in and out of command and the dates of their respective commissions, &c.;" but we do not find any such register in the government records until 1805.[19]

Even if it had been kept during the intervening years, it would not, under the terms of the said resolution, have included midshipmen, who were only warrant officers, classed as to pay and general designation with the sailmaker and cook. It could hardly be expected therefore, that any special notice would be taken of them. Fortunately, however, the names of midshipmen Dale, Preble, and the two Barrons, James and Samuel, have been rescued from oblivion, and we find also mention of Midshipman Mayrant, of the *Bon Homme Richard,* who accompanied Lieutenant Dale of that vessel and the boarding party who took possession of the *Serapis,* and we learn that the midshipman, on

[19] This official list of commissioned officers is found in "American State Papers, Naval Affairs," Vol. 1, appended to the record of Robert Smith, the second Secretary of the Navy, dated December 16, 1805. The next official list of commissioned officers is appended to the report of Secretary Paul Hamilton, dated February 3, 1812. The next official lists are of both commissioned and warrant officers, published in 1813, 1814 and 1815, since which time, excepting the years 1816 and 1817, there has been published in pamphlet form an annual Naval Register of officers of all grades, in conformity with the Resolution of the United States Senate of December 13, 1815. The earliest semi-official muster roll of the navy was that published at Washington in 1800, by the first chief clerk of the Navy Department, Charles W. Goldsborough, who held that position under Secretaries Stoddert, Smith and Hamilton, from 1798 to 1813. This faithful and efficient civil officer was the father of Rear Admiral Goldsborough, deceased. Another semi-official list was the "General Register of Officers from 1798 to 1847 inclusive, compiled in 1848 by Mechlin and Winder." There were also non-official registers published by private individuals at their own risk, such as that of Russell, Cutter & Co., and Joshua Belcher, in 1813, that of Moses Thomas in 1815, and that of Benjamin Homans in 1815. The latter also published one number of a Quarterly Register, but all of these private ventures were discontinued for lack of patronage.

reaching the quarter deck of the *Serapis* "was run through the thigh by a boarding pike in the hands of a man in the waist, who was ignorant of the surrender." (Cooper.)

Midshipman Mayrant therefore has the distinction of being the first and only midshipman of the revolutionary period within our knowledge who was wounded.

There is also occasional mention in the old books of *a midshipman*, no name being given, as follows: Thomas Clark, in his "Naval History of the United States," Philadelphia, 1813, relates that Captain Biddle, commanding the *Andrew Doria*, of 14 guns, in 1776, accompanied by *a midshipman*, both being armed, succeeded by sheer determination in taking back to the ship a number of armed deserters who had barricaded themselves in the Lewiston jail, threatening to shoot the first man who approached to capture them. It is stated, too, that during an epidemic of smallpox on the *Doria*, the humane Biddle gave up his own cot to *a midshipman* afflicted with that disease, whom he tenderly nursed till death supervened, sleeping himself on the hard lockers. Clark also refers to *a midshipman* on board the ship *Queen of France* (Captain Peck), who communicated to him the particulars of a lucky capture, in one misty day, of 11 vessels of the convoyed Jamaica fleet of 150 sail, by Commodore Whipple's little Continental Squadron. These unsatisfactory data, together with the legislation in Congress, already noticed, affecting the midshipmen of the Continental Navy, are the only positive evidences we have of their existence. That their number was considerable is quite probable in view of the statements of the historians of that period that there were more captains than ships in the service, and many more officers of inferior grades than could be employed at any one time. Both commissions and warrants were then in great demand, captains' commissions being eagerly sought for, even by foreign naval officers.[20]

Yet neither Clark, in 1813, nor that most industrious of naval chroniclers, Charles W. Goldsborough, in 1824, could find any more information about the midshipmen of the Revolution than has been given above. It is in Goldsborough's interesting "Naval

[20] In May, 1778, in consequence of the ever increasing supply of American officers, Congress ordered that commissioners of the United States at foreign courts, "shall not recommend any foreign sea-officer, nor give any of them the least expectation of being employed as captain in the navy of the United States."

Chronicle," and in the Journals of Congress, that are preserved the imperfect lists of the commissioned officers of the Continental Navy. The honored names of commanding officers—of Ezek Hopkins, the first commodore; of Captains Nicholson, Manly, Biddle (Nicholas), Barry, Wickes, Whipple, John Paul Jones and others, have come down to us with a sufficient record of their exploits to excite wonder as well as admiration, but the names and services of the midshipmen who shared the toils and triumphs of the Continental Navy must, with the three exceptions mentioned elsewhere, forever remain unknown. The glorious fate of those who lost their young lives in battle we may commemorate in the lines of the sea-poet Falconer:

> What though no sculptured pile your name displays,
> Like those who perish in their Country's cause!
> What though no epic Muse in living lays
> Records your dreadful daring with applause;
> Yet shall Remembrance from oblivion's veil
> Relieve your scene, and sigh with grief sincere,
> And soft compassion at your tragic tale,
> In silent tribute pay her kindred tear.

Who can doubt that these young people found ample inspiration in the example of their self-taught commanders, who "in strictly naval operations displayed all the resources of the best school of trained officers of the period, and in the destruction of the enemy's commerce all the qualities of bold privateersmen." The naval operations of the war, whether on the high seas or inshore, were, is is true, only such as single ships could be expected to undertake, but we certainly read in American annals of this period of matchless seamanship and good gunnery, of daring attack and brilliant defense, of successful ruses and nautical expedients,[21] of surprises, of fierce actions at pistol-shot distances, of vessels locked together in deadly embrace, of others deliberately laid athwart the hawse of an enemy, and of hand to hand encounters worthy of the days of chivalry; and of crews compelling their captains to fight against great odds. And yet none of the officers had pre-

[21] David Bushnell, of Saybrook, Conn., invented several machines for the annoyance of the enemy's ships, such as his sub-marine *American Turtle*, which owing to a slight incident failed to blow up the British frigate *Eagle*. It was he also who at Christmas of 1777 sent down the Delaware the famous *Explosion Kegs*, intended to demolish the British fleet anchored near Philadelphia, and which event gave rise to Francis Hopkinson's song, entitled "The Battle of the Kegs."

viously been trained to the use of ordnance at sea or subjected to naval discipline. And is it not also true that the captains of privateers and private armed vessels, officered and manned by merchantmen, displayed great skill in seamanship and great bravery in battle even when fighting the enemy's vessels of war? "Several naval officers," says Cooper, "for want of regular employment took service in the privateers," which were far superior to those of the enemy, owing in some sense "to the greater degree of relative respectability that is attached to the profession of a seaman in this country, than it is usual to find elsewhere, and to the circumstance that the public marine has never been sufficiently large to receive all of those who would willingly take service in it when the nation has been engaged in war." The government and the people were well satisfied with the work of both services, in despite of defeats and disasters. There were men among these captains and commanders of good education and heroic mould, fitted to shine in civic as well as in military life; there were also men among them of coarser, rougher type, with a dash of the buccanneer which, unrestrained by their commissions and patriotism, might have placed them in the category of bloody sea-rovers. But the reckless spirit of the freebooter was transformed by a bit of parchment and the divine love of country into a lofty spirit of devotion to the revolutionary cause. Some of the captains purchased small arms with their own money, and their patriotic wives made the flags they fought under. All these men were better than their ships or weapons, which was fortunate for the cause, as in some instances the mettle of our fearless seamen in command proved to be of more avail in determining the issue of a fight than all the gun metal in the ship.

Although the lieutenants of this period are scarcely mentioned in the histories, it cannot be doubted that they too deserved well of their country. We find in the records only the following names: Stiles, Ogilby, Kissick, Gill, Phittiplace, Salter, Dote, Wiglesworth, Roche, Tiley, Arnold, Stansbury, Hacker, Lunt, Dale, Pitcher, Seabury, Olney, Warner, Weaver, McDougall, Burroughs, Fanning, Vaughan, Greenway, French, Martin, Hume, Tibbs, Batson, Matthewman, Gamble, Pomeroy, and Armitage, the last twelve of whom, on one occasion, in the port of Philadelphia, unwisely refused to do duty until a petition of theirs for increased pay was acted upon by the Marine Committee; the pay

of lieutenants being $30 per month if serving in a frigate, and $24 per month in vessels of smaller size. This military offense of "combination" gave rise to the first case of disciplinary punishment of officers of the Continental Navy. The insubordinate twelve were promptly dismissed from the service by the Marine Committee on July 23, 1777, and rendered incapable of holding commissions or warrants under the authority of the United States; but they were restored to rank and command by Congress on the 28th of July, after having acknowledged in the most explicit manner "the gravity of their offence, and expressed sorrow for the rashness which betrayed them into such behavior." We do not read of any such insubordination on the part of the midshipmen of that period, although there was some provocation thereto in classing them with the "ship's cook" as to pay. Fortunately the temptations to spend money were not manifold in those days of rigid economy, when even the frequenting of theatres was forbidden to all officers of the United States by resolution of Congress (October 15, 1778), under penalty of dismissal, because it diverted the mind "from due attention to the means necessary for the defense of the country." But whatever discontent there may have been on the score of pay or preferment, officers of all grades in the army and navy had common cause for rejoicing when the original "pine-tree flag" of 1775[22] and the later one of 1776, were replaced by the permanent national flag of thirteen stripes, alternate red and white with a union of thirteen stars in a blue field, destined to great glory thereafter in many a battle by land and sea.[23]

The first hoisting of this flag afloat—an event never to be forgotten—occurred at noon on July 4, 1777, says Clark, when "all the armed ships and galleys in the Delaware River were drawn up before the city of Philadelphia and dressed in the gayest manner with the colors of the United States and streamers flying in

[22] John Paul Jones, when commissioned as first lieutenant to the *Alfred*, 24 guns, anchored before Philadelphia in December, 1775, had the honor of hoisting with his own hands at her peak the first pine-tree flag of the United States.

[23] The most singular fate that ever befell our national flag in battle is quoted by Clark, from the "*Remembrancer*," to the effect that, when Captain Biddle's ship, the *Randolph*, of 32 guns, was blown up March 7, 1778, by the British ship *Yarmouth*, of 64 guns, "an American ensign rolled up was thrown upon the forecastle of the latter without even being singed."

celebration of the day." This eloquent flag representing the newly-born nation, resulting from the union of the thirteen colonies, sent a thrill of redoubled patriotism through every manly breast in the Army and Navy of the United States. Even its coloring had appropriate significance, the white being emblematic of innocence, perseverance and justice, qualities, says Hamilton, "possessed in an eminent degree by the chiefs and leaders of the Revolutionary struggle." These stalwart patriots, and the men who served under their command ashore and afloat had not the inspiration of a war song to nerve their strong arms in battle. In fact nothing of the sort had yet been heard at campfire or in the forecastle except the old "Roundhead" tune, originally known in England as "Nankee Doodle," but Americanized into "Yankee Doodle,"[56] which was played in the field by Colonial bands in defiant reply to the British anthem, "God Save the King," and perhaps with some inspiriting effect.

In this connection, it is to be regretted that there was no Rouget de Lisle among the Yankee soldiers to give the patriot cause a war song like that which fires the blood of every Frenchman at

[56] Rear-Admiral George H. Preble, U. S. N., in his interesting History of the American Flag, informs us that the words of this song date back to the wars of the Roundheads and Cavaliers, the tune, however, being much older, "having been known from time immemorial all over the Continent of Europe." There have been a great many asserted origins of "Yankee Doodle." The following is the last, related in a letter from Spain by Wm. S. Bryant, the poet:

Some time since, when Mr. Perry, Secretary of the American Legation at Madrid, was in one of the Basque provinces, he heard a band playing their old national airs. The Basques have preserved whatever is peculiar to them, their language, their customs, and many of their political rights, from the earliest period in which they are known to history; their national music is claimed to be of the same antiquity. After the band had played several other airs it struck up "Yankee Doodle," the very tune, in every note, which is so familiar to American ears. Mr. Perry immediately claimed it as our national air. "It is one of our old tunes," said a gentleman to whom he spoke, "and I can convince you of the fact; for hundreds of years it has been a popular air among us." The gentleman afterward made good his assertion by showing Mr. Perry a manuscript of great antiquity which contained the identical musical notes of "Yankee Doodle." It was introduced into America in 1755 by Dr. Schuchburg, a surgeon of the regular British troops at Albany, the words being derisive of the raw, ragged colonial troops gathered there for a movement against the French posts of Niagara and Frontenac. Its jingle and liveliness adapted it easily for a military march, but in the subsequent revolutionary war it was made to do patriotic duty as stated above.

home and abroad. If our French allies, so happy in their own battle lyrics, had given to the Yankee forces a thrilling war song in addition to the all powerful aid of fleets and armies, we never could have repaid that obligation in kind. As it was, the only return our fathers were able to make for the great boon of the alliance itself was the gratitude of the nation, accentuated by its representatives in Congress in the presentation to the French government, in November, 1782, of the newly-built 74 gun ship *America*—the largest war-vessel of her class and time—to replace the French 74 *Magnifique*, wrecked in the harbor of Boston.

In the absence of an original American midshipman's warrant of this period, or of an authentic copy thereof, we can only surmise that, with some necessary change in its wording, it was similar to that in use in the British Navy. But we are not left in doubt about the form of commission issued to commanding officers, one of the earliest of these instruments, adopted by Congress April 20, 1780, being printed in the Statutes at Large, Vol. 1, in which the obligations of this class of officers and the hydra-headed authority which they were then sworn to obey are plainly stated as follows:[28]

THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED--

To .....GREETING:

We, reposing especial trust and confidence in your valor, conduct, and fidelity, do by these presents constitute and appoint you to be ..... in the Navy of the United States, to take rank from the.....You are therefore carefully and diligently to discharge the duty of.....by doing and performing all manner of things thereunto belonging. And we do strictly charge and require all officers, marines, and seamen under your command to be obedient to your orders as.....And you are to observe and follow such orders and directions, from time to time, as you shall receive from Congress, a Committee of the States, the Board of Admiralty, the Commander-in-Chief, for the time being, of the Navy of the United States, or any other your superior officer, according to the rules and discipline of the Navy and the usage of the sea. This Commission to continue in force until revoked by Congress or a Committee of the Senate.

Witness.....President of the Congress of the United States of America, at.....the.....day of .....in the year of our Lord.....and in the .....of our independence.

Entered in the Admiralty office, and examined by the board.

Attest.....Secretary of the Board of Admiralty.

[28] The original commission of the soldier-sailor John Barry, as captain in the Navy of the United States, dated February 22, 1797, and nearly resembling the present form of captain's commission, is preserved in the library of the Naval Academy.

At the close of the Revolutionary War, the subject of military education was taken up by some officers of high rank in the army, who had experienced the want of it in the field. It was doubtless much discussed also among the junior officers, many of whom had volunteered for the war fresh from one or other of the nine young colleges already established in different parts of the country.[26]

But the man above all others who felt its importance was the commander-in-chief, whose limited early education had been obtained in one of the old "field schoolhouses then common in Virginia, kept by Sexton Hobby, where he played soldier with his schoolmates." Throughout his long career as surveyor, soldier, general and president, he had learned to estimate the great value of mental discipline and training for the youth destined for the service of the State in any capacity. Fortunately too, General Washington possessed the foresight of a statesman as well as the instincts of a soldier, which enabled him to treat not only the subject of the public defense, but also the broader subject of general education with wonderful perspicacity. Indeed, it was the dream of his later life to found a national university which, he believed "would tend to assimilate the principles, opinions and manners of the people, and to insure the permanence of the Union;" but the grand project could not be realized in his time.[27]

It is stated too, that he encouraged the immature projects of James Rumsey and John Fitch [28] for propelling vessels by mechanical power or steam, and it is not improbable that Bushnell's novel and ingenious submarine torpedo experiments, and numerous attempts to blow up British vessels during the war, excited un-

[26] The so-called colleges founded in the American Colonies previous to the Revolution were—Harvard, in 1638; William and Mary in 1693; Yale in 1701; Princeton in 1746; the University of Pennsylvania in 1748; King's (afterwards Columbia) in 1754; Brown in 1764; Dartmouth in 1769; and Rutgers in 1770.

[27] It was started in 1782, upon an humble basis as the "Liberty Hall Academy," at Lexington, Virginia, with a partial endowment from General Washington. After his death, it received the name of Washington Academy, and is now known as the "Washington and Lee University," being well on its way towards the high standard contemplated by its original founder.

[28] John Fitch, in 1791, predicted that sailing vessels would be superseded in the carrying trade by steamers, but it was not until 1819 that the first American ocean steamer *Savannah* crossed the Atlantic to Liverpool.

wonted interest in his intelligent mind. But the chief effort of the great soldier was to bring about the establishment of a school for the education and training of competent subaltern officers for the army of the future, in which connection he thus clearly and emphatically outlined the true military policy for the young.

"In proportion as the observance of pacific maxims might exempt a nation from the necessity of practising the rules of the military art, so ought to be its care in preserving and transmitting by proper establishments the knowledge of that art. Whatever argument may be drawn from particular examples, superficially viewed, a thorough examination of the subject will evince that the art of war is extensive and complicated; that it demands much previous study, and that the possession of it in its most improved and perfect state is always of great moment to the security of a nation. This, however, ought to be a serious care of every government, and for this purpose, an academy, where a regular course of instruction is given, is an obvious expedient, which different nations have successfully employed."

At the same time, he urged Congress to set about the gradual creation of a navy for the protection of American commerce on the high seas, and to organize it "so that it should be always ready to vindicate our flag from insult."

"To an active external commerce, the protection of a naval force is indispensable. This is manifest with regard to wars in which a State itself is a party. But besides this, it is in our own experience that the most sincere neutrality is not a sufficient guard against the depredations of nations at war. To secure respect to a neutral flag requires a naval force organized and ready to vindicate it from insult of aggression." [39]

No suggestion is made in regard to naval education, but it is implied in the solemn warning of this practiced master of the art of war, who understood well the importance of careful and special training for the naval as well as for the military arm of the public defense. Indeed, we have evidence of this in his subsequent approval of a plan for a combined military and naval academy—opposed by his Secretary of State, Mr. Jefferson, as unconstitutional and aristocratic—which would doubtless have been carried out in some form by his personal influence had he been spared to witness the results of the Tripolitan War.

[39] President Washington's eighth annual address to the Senate and House of Representatives, December 7, 1796.

The plan alluded to here is that of Alexander Hamilton. This eminent statesman, convinced that the young Republic was destined to become a great power by land and by sea, wisely sought to provide for the careful training of young officers who were in the future to exercise command either in the military or naval service. His first impressions upon this subject were expressed in a letter, dated June 5, 1798, to Oliver Wolcott, Secretary of the Treasury, and were subsequently embodied in the form of an elaborate plan for a combined military and naval academy, which he submitted to James McHenry, Secretary of War, in a letter dated November 23, 1799. A copy of this plan was forwarded to General Washington, then living in retirement at Mount Vernon, and this great man, in the last letter written by his hand[*] approved it, adding that during his term of office as President he had omitted no opportunity of recommending the general subject of military education to the attention of Congress. The Secretary of War embodied Hamilton's plan, with a few modifications, in a special report to President Adams, who submitted it to Congress with his approval on the 14th of January, 1800. The following extracts from this report explain the naval feature of the plan:

"It is proposed that this academy shall consist of four schools; one to be called the Fundamental School; another, the School of Engineers and Artillerists; another, the School of Cavalry; and a fourth, the School of the Navy." The first three were to be under one general director, with subordinate directors, professors, &c., for each. The fourth, or "School of the Navy," was to have "a director under the orders of the Secretary of the Navy, a professor of mathematics, a professor of geography and natural philosophy, an architect, and a designing and drawing master." All the pupils of the academy were to spend two years in the Fundamental School, where a theoretical knowledge of the sciences involved in each of the branches of the art of war was to be obtained. The application or practice of the theoretical knowledge thus acquired was to be the business of the other respective schools for two additional years, each being in this confined to the branch which its name or title indicated. Thus the School of the Navy was designed especially "to teach those appointed to or destined for this service the application of the knowledge acquired in the Fundamental School, in arithmetic,

[*] This letter is dated December 12, 1799, two days before his death.

algebra, geometry, statics and navigation. To this end, after having passed an examination, they shall make voyages or cruises under skillful officers for certain periods, during which time they ought to be exercised in the maneuvers and observations most useful in the service, and be instructed in whatever respects rigging of vessels of war, pilotage, and the management of the cannon." All the schools were to be provided "with proper apparatus and instruments for philosophical and chemical experiments, for astronomical and nautical observations, for surveying and such other processes as are requisite to the several branches of instruction." [2]

This grand scheme, far in advance of the ideas or necessities of the time, was designed "as a substitution of the elements of an army and navy for the things themselves," which were then hopefully struggling for a permanent existence. Hamilton knew well that a separate school for the Navy would not receive the support of Congress, or even of the profession itself, and, in the same almost apologetic way in which so many measures intended for the benefit of the Navy were put forward for nearly a quarter of a century afterward, he was obliged to make the naval feature of the plan of secondary importance, in the hope of gaining at least some recognition of its merits. In this effort he was warmly supported by President Adams; but Congress turned a deaf ear to argument on this point, and established the Military Academy at West Point, in 1801, without the proposed school of the Navy. The former, however, during the first ten years of its existence, had no special organization as a school, being resorted to by officers of the Engineer Corps for instruction in mathematics only when not engaged on other duty. But it was a most encouraging help to the sister service, leading up to its permanent establishment in 1812, upon the broad basis of its original projectors, with professorships, a good programme of studies, and a strict military organization.

When peace with England was declared in 1783, a few surviving vessels of the Continental Navy were sold for prudential or economic reasons, and the naval officers, like their brothers in the Army, laid aside their swords and uniforms with but little hope of being called again into active service. But events so shaped themselves that Congress, although opposed to the creation

[2] Annals of Congress, Vol. 10, 6th Congress.

of a navy, was compelled by the force of public opinion to call into existence new naval armaments for the protection of our commerce upon the high seas. If it had not been for the depredation of Algerine pirates, and French and English armed vessels, the history of our Navy would have commenced at a later period, leaving some of its most brilliant pages unwritten. And so it happened that Congress, by the Act of March 27, 1794, provided for the building of six heavy frigates, which proved to be the foundation of a permanent naval establishment. This legislative enactment must have rejoiced the souls of Barry, Dale, Truxtun and other officers rusting in retirement. At last the time was near at hand when the despoilers of our commerce were to be taught a lesson that they would never forget, and we can well imagine the impatience with which the captains just named watched the progress of the three frigates first built—the *United States*, *Constitution* and *Constellation*—which they were respectively to command. Their eagerness to go in search of the enemy, and especially to chastise the pirates who held in bondage so many of our seamen, is nobly expressed in their joint letter to Secretary Knox, which is worthy of special notice as the first of many legacies of patriotic purpose left to their successors by the gallant officers of our early naval armaments.

"It would be highly gratifying to us who have thrown aside our former occupation, and the prospects that promised fair for increasing our fortunes, with a view of serving our country, and who have no desire of being mere sinecure officers, if we could at this moment embark, and obey the commands of our country in going in pursuit of a barbarous enemy, who now holds in chains and slavery so many of our unfortunate fellow citizens; the relieving and restoring of which to the bosoms of their families and friends, are, with that of having an opportunity to chastise their cruel oppressors, objects of our greatest ambition, and which we anticipate with all the ardor of officers, of seamen, and of citizens. We therefore assure you, sir, that every exertion shall be made by us, in our department, to facilitate the building and equipment of the ships, to which we have had the honor to be appointed commanders and superintendents."[22]

Soon afterwards a peace with Algiers was concluded which

[22] Letter dated December 18, 1794. American State Papers—Naval Affairs, Vol. I.

for a time disposed of the pirates, but greatly disappointed the hopes of the officers, who longed for an opportunity of punishing them. In the meantime the frigates were completed according to the plans of Joshua Humphreys and other ship-builders of that day,[33] and by subsequent legislation the young navy had so increased in 1798 as to require the creation of a separate department of the government for its administration.[34]

It was now to be an efficient though small force, with ships of better models, guns of larger caliber, equipments of better workmanship, and crews of better selection than of any previous period. Thenceforward, too, the manifold interests of the naval service of the United States, including the professional training of its junior officers, and especially of its midshipmen—the hope of the navy—were confined to the watchful care of successive Secretaries of the Navy, who, with one exception, perhaps, have proved faithful to the important trust resposed in them.

It was fortunate for the young navy, as well as for its midshipmen, that it had come into existence during a warlike period. Had it been born in the piping times of peace, it could not, in its infancy, have proved its great value to the nation, nor would its junior officers have had the training which made them so efficient. They were, in fact, brought up in the school of war afloat—the best of schools, it must be admitted, for the acquisition of that seamanlike skill which was then the sole aim of the naval officer, and which must ever constitute his chief claim to professional distinction. The ships and squadrons that sailed under our flag from 1798 to 1815 were so many schools of practice, in which officers of all grades became thoroughly proficient in the difficult art of naval warfare, and were taught those elevated maxims of

[33] The best American ship-builders of this period were Joshua Humphreys, the first in ability and energy, who built the *United States* 44, at Philadelphia; George Claghorn, who built the *Constitution* 44, after Humphreys' model at Hart's Yard in Boston; Forman Cheeseman, who built the *President* 44, at New York; John Morgan, who built the *Chesapeake* 38, at Norfolk; David Stodder, who built the *Congress* 38, at Portsmouth, N. H. To these men the navy was indebted for "the substantial frigates and sloops of beautiful lines and harmonious proportions which replaced the cumbersome, old-fashioned hulks of the Revolution."

[34] The office of Secretary of the Navy was created by law, April 30, 1798. Previously, naval affairs had been administered successively by a Marine Committee, assisted by a Continental Navy Board (1775-79), by a Board of Admiralty (1779-81), by a Secretary of the Marine (1781), by an Agent of the Marine (1781), and by the Secretary of War (1781-98).

discipline, daring, and duty, which have ever since distinguished the naval service of the United States. For the purpose of this narrative, only such notice will be taken of these war schools as illustrates their usefulness in the matter of training, the character of the officers in control of the midshipmen, and the deeds and general conduct of the latter.

The earliest school of practical warfare in the United States Navy was the force dispatched to the West India Seas, in 1798, under the direction of Benjamin Stoddert, the first Secretary of the Navy, for the protecton of American commerce against the assaults of the French armed vessels. How changed already was the situation between the allies of the Revolutionary War. It was France, sorely beset by her enemies, that now sought the aid of the young American nation, under the Franklin treaty of 1778, but the United States was too weak to carry out her part of the mutual guarantee. So France unwisely decided to turn her guns against the neutral, unprotected commerce of the United States, which policy aroused the government to measures of retaliation without a formal declaration of war. Of course this quasi-war[35] was heartily supported by the entire mercantile community—then the main prop of the young Republic. "Families of the highest social and political influence, says Cooper, pressed forward to offer their sons to the service, and, the navy being the favorite branch, nearly all of those who thus presented themselves, and whose ages did not preclude the probationary delay, had their names enrolled on the list of midshipmen. Young and intelligent seamen were taken from the merchant service to receive the rank of lieutenants, and the commanders were either chosen from among those who had seen service in the War of the Revolution, or who by experience in the charge of Indiamen and other vessels of value, were accustomed to responsibility and command."[36]

"The cities of the seaboard swarmed with sailors anxious to

[35] Quasi-war of 1799. It was believed that New York would be attacked by a French naval force, and such was the enthusiasm of the young men of that city that the whole body of professors and students of Columbia College went to Governor's Island and worked hard with shovels and wheelbarrows on the fortification, named Fort Jay, which the government caused to be erected on the Island for the defense of the harbor. This earthwork was the beginning of what was afterwards known as Fort Columbus.

[36] Cooper's Naval History of the United States, Vol. I.

enlist for the war, and the cocked hats, blue coats and red waistcoats of the newly appointed naval officers gladdened the eyes of the patriotic citizens." [37]

"In those days," says the same writer, "the harness was put on as soon as the precious parchment was received, and only laid aside to turn in." It is probable, too, that in the superabundant spirit of patriotism each newly fledged officer deemed it his duty to learn the national hymn, "Hail Columbia," [38] then just written (1798), by Joseph Hopkinson, as a means of uniting in one purpose the two parties of his countrymen, divided upon the question of war.

The books tell us that before the close of the first year of hostilities there were not less than twenty-three vessels, carrying 472 guns, sailing under the American flag in the West India Seas, in four squadrons, commanded by Commodores Barry, Truxtun, Tingey, and Stephen Decatur, senior. Among these vessels were the *Ganges* (Captain Richard Dale), the first man-of-war that bore our flag under the new organization, and the frigates *Constellation, United States*, and *Constitution*—their first appearance in the panoply of war—which were destined to great glory in the future. It was in this school that the heroes of subsequent naval wars received their first lessons in seamanship and gunnery. They were distributed among ships, according to the rating of the same, eight midshipmen to a 44, six to a 36, and four to a 24 gun ship. Their pay was increased by the President of the United States, from the Continental standard of 12, to 19 dollars per month, with the addition of one daily ration (valued then at 28 cents), which was served in steerage messes with Spartan simplicity and washed down with the half-pint of grog allowed by the regulations to officers. For many years they were obliged to live exclusively upon the Navy ration, instead of drawing its money value from the purser, which was done by the wardroom officers. The midshipmen of that period

[37] Cooper, Afloat and Ashore.

[38] The words of this song, says Preble, were adapted to the air of the "President's March,"—composed in honor of Washington—by Philip Roth, a German musician at Philadelphia. When it was first sung in public, by Mr. Gilbert Fox, in a theater in that city, the audience demanded its repetition eight times. It was at once adopted by the people as a national song, although, in the opinion of Lossing, another song of the same period, "Adams and Liberty," now forgotten, had more of the true poetic ring.

(1798-1800) were chiefly ardent volunteers who entered the service with a burning desire to serve their country on the sea. Some of them had previously made one or more voyages in the merchant service, and could "hand, reef and steer," while others had acquired a smattering of theoretical navigation in schools kept (in different seaboard towns) by retired sea captains.

It was in one of these schools, at Philadelphia, kept by Mr. Talbot Hamilton, a retired officer of the British Navy, that the younger Decatur (Stephen) [39] was hastily crammed in the alphabet of navigation before joining his first ship (the *United States*, Captain Barry) as a midshipman. Afterwards he was at the Pennsylvania University for more than a year, but he wearied of dry study and entered the counting house of his father's associate in 1796, when he had completed his seventeenth year. At every leisure moment he studied mathematics, drawing, construction, and the sparring and rigging of ships, and his employers, who were agents of the Navy in Philadelphia, sent him to superintend getting out the keel-pieces of the frigate *United States*, then building in Philadelphia. He was afterwards launched in her "assisting in the nativity of the gallant old ship that, in due time, he was to lead to victory."

Young Stephen Decatur had seen his father sail in command of the *Delaware*, of 20 guns, and bring back in triumph (in the French War) the first of the enemy's cruisers that had been captured (the French privateers *Le Croyable* and *Marsouin*); had had the pleasure also of seeing him in 1800 in command of 13 sail of armed vessels on the Guadeloupe Station; and shared his father's feelings of resentment against France for the spoliations and indignities with which she had assailed our commerce. Commodore Barry, observing the rare fitness of Stephen for the sea, without his request or that of his father, obtained a warrant as midshipman for him, dated back with others, to the 30th of April, 1798. So he joined Barry's ship, the *United States*, finding on board of her two of his old schoolmates, Stewart (as 4th lieutenant), and Somers, as midshipman, senior to himself. He gave his first month's pay to the widow of Gordon, a shipmaster,

[39] Life of Stephen Decatur by Alex. S. MacKenzie, Boston, 1846. His father, Stephen Decatur, senior, born in Newport, Rhode Island, in 1751, died in 1808, was determined to perpetuate his name in the service as he put his three sons in it, viz.: Stephen, Jr., James, and, after the latter was killed, his youngest son, John.

who had been his first teacher in childhood. He joined the ship in May, when he was entering his twentieth year, and, well informed for his age, had the very great advantage of commencing his career under the vigilant eye of Barry—then one of the best officers in the service. Between his appointment and putting to sea, he employed all his leisure from duty in studying navigation under the instruction of Mr. Talbot Hamilton, who kept an academy for that purpose in Lower Dublin, in the environs of Philadelphia. Whilst on shipboard he was equally diligent in preparing himself to be useful. He took the trouble to write the name of each rope behind the rail with his pencil, to avoid frequent inquiries for information. When young Jacob Jones* joined the ship, before her second cruise, Decatur, remembering his own difficulty in learning the ropes, suggested to his young friend the use of this expedient, which he adopted with advantage.

Decatur's services in the *United States* secured his promotion to lieutenant "after a brief probation of a single year." In fact he had been performing the duty of a lieutenant during a part of the time previous to his promotion. He also distinguished himself, while acting as lieutenant on the *United States* in the West Indies, by an act outside the line of duty, in jumping overboard to save a drowning sailor.

Decatur fought his first duel at Newcastle with the chief mate of an American Indiaman, and shot him in the hip, with deliberate purpose of saving his life by not aiming at a vital part. Somers was his second.

In the same ship and mess with Decatur were Midshipmen Crane, Caldwell, Jones, Somers, and Stewart. Midshipmen Clagett, Dent, Davis, Henley (Robert), Herbert, McDonough (J. M.), Porter, Robinson, Sinclair, Vandyke and Wenderstrandt, were on board the lucky frigate *Constellation*, 38 guns, during her first cruise; Lawrence and others were on board the *Ganges*, while Midshipmen Allen, Bainbridge (Joseph), Biddle (James), Blakely, Burrows, Cassin, Creighton, Downes, Decatur (James), Henley (John D.), Izarf, Israel, Thomas Truxtun, Jr., Morris, Perry (Oliver H.), Rowe, Spence, Trippe, Wadsworth, War-

* Jacob Jones had received a good academic education, and commenced the study of medicine when in his 18th year. He entered the naval service as midshipman in 1799. In the same year his friend, Robert Henley, who was well advanced in his education at William and Mary College, in Virginia, received a midshipman's warrant.

rington, Thorn (Matthew), Woolsey and many others of dates previous to the peace establishment of 1801—who were to fill many bright pages in our naval history—sailed in the *Congress, Delaware, Essex,* and other cruisers of that day. It would be a difficult matter in any naval service to find such a promising group of young officers.

It was not long before young Stewart, promoted to the command of the famous schooner *Experiment,* of 12 guns, had an opportunity of distinguishing himself by capturing the French schooner *Deux Amis,* of 8 guns, after a spirited action of ten minutes. "Afterwards," says Frost, "he performed a splendid feat of seamanship while being chased by a French schooner of 14 guns. By skillful maneuvering he brought his vessel in the enemy's wake, opened fire upon her and captured her in five minutes."

About the same time young Bainbridge,[a] who had begun his career before the mast at fifteen, was first mate of a merchantman in his 18th year, and commanded her in his 19th year. He was appointed a lieutenant in the navy in 1798, in which year he commanded the armed schooner *Retaliation,* and was captured by the French flag-ship *Volontier.*

It is interesting to note that while in command of the *Independence* and of the Boston Navy Yard, in 1815, Commodore Bainbridge established a school in the said yard for the instruction of his young officers, under the direction of Chaplain Felsh, of the Navy. His order to Chaplain Felsh is as follows:

U. S. SHIP "INDEPENDENCE,"

BOSTON HARBOR, Dec. 10, 1815.

The Rev. Mr. Felsh,

SIR: I have to direct that you open a Naval School within the Navy Yard at Charlestown, in such apartments as Captain Hall may assign to you, for the purpose of instructing the officers of the squadron in those branches of mathematics which appertain to their profession. The school must be open every day in the week, Sunday excepted, the hours of study must be from 9.00 a. m. to 1.00 p. m. You will daily report to me the names of the officers who attend. Once a fortnight you will make to me a general report of the respective branches of study in which each officer is engaged, accompanied with candid remarks on their conduct, attention and progress.

WM. BAINBRIDGE.

[a] Dr. Thomas Harris's "Life of Commodore Wm. Bainbridge," Philadelphia, 1837.

In October, 1819, a board of senior captains, of which Commodore Bainbridge was president, was convened in Norfolk by order of Secretary of the Navy to examine midshipmen for promotion. This was the first ordeal of that sort instituted by the government, and it was found so beneficial that it was continued from year to year, so that promotion to a lieutenancy could be obtained only after a rigorous examination in seamanship and mathematics—it being required also that each candidate should funrnish the board testimonials of professional and moral standing as midshipmen.

Bainbridge " was a rigid disciplinarian, and in his early career perhaps too much so. This error, not uncommon among young commanders, arose from over zeal—which is corrected by reflection and advancing years." Bainbridge himself called it " youthful ardor," and he rejoiced that " he had lived to alter the system of terror which once prevailed in the public ships." Judicious flogging he approved of. He was considered by young officers as their model and beau ideal of a naval officer.

Another midshipman of the *Constellation*, David Porter, then eighteen years of age, proved himself a hero of the first quality. Stationed in the foretop of that vessel, he perceived that an 18 pound shot from the *Insurgente* had struck the foremast just above the cap, injuring it so that it was in danger of falling; and, as there was no response from the deck to his hail of alarm—owing to the din of battle—" he with great presence of mind, judgment and gallantry, clambered up the spar amidst a shower of balls, cut away the slings, and thus saved the mast," preventing perhaps a greater disaster. But this brave youth was subjected to a severer test of manhood when, at the close of the engagement, with eleven sailors under the command of Lieutenant John Rodgers, he was sent to take possession of the prize and transfer her crew to the *Constellation*. After a few of the men had been transferred, darkness set in, and the ships were separated in a gale, leaving Rodgers, Porter, and the few sailors with them, at the mercy of 173 infuriated Frenchmen, ready at a favorable moment to retake the ship. But the handful of vigilant Americans succeeded in controlling the captives, weathering the storm, and navigating the prize into the harbor of St. Kitts, after a most exhausting trial of sleepless endurance lasting two days and three nights. " This," says Goldsborough, " was a service

not to be envied by the boldest man living," and surely it is not too much to say that these first heroic deeds of an American midshipman entitled young Porter to a large share of the resolution of thanks voted by Congress "to the officers and crew of the *Constellation.*"

Another instance of remarkable bravery on the part of a midshipman occurred in the subsequent night action of February 1, 1800, off Guadeloupe, between the *Constellation,* under Truxtun, and the French frigate *Vengeance,* of 54 guns, which resulted in the defeat of the latter, with the loss of not less than 160 of her people, killed and wounded, although she was fortunate enough to escape into Curaçao in the darkness. In this action, of five hours' duration, there were twelve midshipmen present, four of whom had been in the previous fight with the *Insurgente,* and eight were new appointments, under fire for the first time. One of these, Robert Henley, showed so much gallantry during the action that Truxtun said of him "That stripling is destined to be a brave officer," which proved to be only a part of his professional worth. But the hero of the occasion was the youngest of the eight, James Jarvis, of New York. This youth, stationed in the main-top, was ordered to secure the main-mast that had been stripped of its rigging by the shot of the *Vengeance,* but the top-men had scarcely begun the task when the mast went by the board, carrying with it Jarvis and his men. "This young gentleman," says Captain Truxtun in his report of the action, "was apprized of his danger by an old seaman, but he had already so deeply grafted on his mind the principle of an officer, not to leave his quarters, that he replied, 'if the mast goes, we must go with it.' I regret much his loss as a promising young officer and amiable young man." This heroic act of self-immolation, not excelled in naval history, indicated a lofty sense of duty thereafter recognized by the corps of midshipmen as the standard to which all should aim in battle. No wonder that the new marine became at once so popular that the most respectable families of the nation were more than ever desirous of having their sons enrolled in the list of midshipmen. Jarvis lost his life, but gained immortal fame among men in the first resolution of Congress specially commemorating the glorious deed and death of an American midshipman. "That the conduct of James Jarvis, a midshipman in said frigate, who gloriously preferred certain death

to an abandonment of his post, is deserving of the highest praise, and the loss of so prominent an officer is a subject of national regret." [a]

Captain Truxtun himself was not more handsomely rewarded by Congress than the youngest of his midshipman. Indeed, it was the just and generous spirit of this chief of high degree that secured for all "the gentlemen sailors and soldiers of the ship's company," as he styled them, a proper recognition of their merits at the hands of the government. And in his report of the action with the *Insurgente* we find the following rare and emphatic testimony of the merits of the inferior officers (midshipmen) which is worthy of special notice.

"It must not, therefore, be understood because I have mentioned the names of a few of the principal gentlemen that those of an inferior grade in their stations are less deserving; on the contrary, to the latter I always felt the most indebted for their exertions in the hour of battle, as they have generally much less at stake than those in higher stations, and consequently less inducement to display their valor."

This is, perhaps, the first and only instance in the whole range of naval dispatches from commanding officers, in which the value of midshipmen's services in battle is pointedly indicated. And the fact should endear Truxtun's memory to the honorable grade of midshipmen for all time.

Congress voted a gold medal to Truxtun.

Congress voted a resolution to Midshipman Jarvis.

Congress voted a sword to Lieutenant Commanding Sterrett.

Yet these were rather rough times for midshipmen, for Admiral Porter tells us, in his "Life of Commodore Porter," that in this French quasi-war "it was customary to swear at the midshipmen, to send them to the mast-head, and to confine them for slight offences on bread and water." The commodore, when a midshipman on the *Constellation*, was on one occasion struck in the face by a lieutenant, so that even Truxtun's presence did not shelter them from cruelty.

No writer has taken the trouble to inquire what influences the midshipmen of a ship-of-war have exercised in the attainment of naval triumph. There is the chief in command who, of course, is entitled to the lion's share of the honors of victory, to which,

[a] Act of Congress, approved March 29, 1800.

it is admitted, lieutenants in charge of divisions of guns greatly contribute. But is it not also true that the enthusiasm and heroism of midshipmen, stationed wherever shot or shell may strike, do contribute morally as well as by physical effort to victory? What seaman could flinch from his gun while the young reefer stands by facing the iron hail, and when the soul-stirring cry of "Boarders away" was heard, who could have held back when a mere stripling was in the van of the attack? The vigor and enthusiasm of youth, if well directed, and other things being equal, will always materially help to win battles ashore or afloat. It often makes up for lack of numbers or weight of metal; it fires up the slumbering or decaying energies of older heads, and may by its dash overwhelm an enemy confiding too much in numbers. We commend this field of inquiry to the historians of future naval wars with an assurance that they will find in it ample material for well deserved eulogium.

Although there were but few opportunities for distinction in the French quasi-war, it was nevertheless a good school of seamanship and discipline, by which means the enemy were outmaneuvered and out-fought. It was certainly an encouraging beginning for a new navy officered mainly by young lads "who had never seen a gun fired in anger before," to be able to put on record, in the first year of its existence, two decided victories won by the same captain in the same ship, over vessels of equal or superior force and better model, and two rare deeds of heroism by two young midshipmen, worthy of any period of naval history.

There was enough of inspiration in these events to form themes for sea-songs of the Dibdin type, then so popular in England, but we find only "Truxtun's Victory" (set to the music of "Hearts of Oak"), celebrated by a poetaster of the time, whose verses, although of inferior poetic merit, were as popular in New York and Boston as Dibdin's in London. As this doggerel song, composed just after this event, was sung everywhere in private and public gatherings and on board our cruisers, and was sold at street corners with pictures of the battle, after the old London custom, it may properly be introduced here as the first and oldest American sea-song, long forgotten by the public:

"TRUXTUN'S VICTORY."

THE CONSTELLATION AND THE INSURGENTE.

February, 1799.

Come all ye Yankee sailors, with swords and pikes advance,
'Tis time to try your courage and humble haughty France,
The sons of France our seas invade,
Destroy our commerce and our trade,
'Tis time the reck'ning should be paid
To brave Yankee boys.

On board the *Constellation,* from Baltimore we came,
We had a bold commander and Truxtun was his name!
Our ship she mounted forty guns,
And on the main so swiftly runs,
To prove to France Columbia's sons
Are brave Yankee boys.

We sailed to the West Indies in order to annoy
The invaders of our commerce, to burn, sink and destroy;
Our *Constellation* shone so bright,
The Frenchmen could not bear the sight,
And away they scampered in a fright,
From the brave Yankee boys.

'Twas on the 9th of February, at Montserrat we lay,
And there we spy'd the *Insurgente* just at break of day,
We raised the orange and the blue,
To see if they our signals knew,
The *Constellation* and her crew
Of brave Yankee boys.

Then all hands were called to quarters while we pursued in chase,
With well primed guns, our tompions out, well spliced the main brace,
Soon to the French we did draw nigh,
Compell'd to fight they were, or fly,
The word was passed, "Conquer or Die,"
My brave Yankee boys.

Loud our cannons thunder'd with peals tremendous roar,
And death upon our bullets' wings that drenched their decks with gore,
The blood did from their scuppers run,
Their chief exclaimed, "We are undone,"
Their flag they struck, the battle won,
By the brave Yankee boys.

Then to St. Kitts we steered, we bro't her safe in port,
The grand salute was fired and answered from the fort,
John Adams in full bumpers toast,
George Washington, Columbia's boast,
And now "the girl we love the most!"
My brave Yankee boys.

Then raise the high strain, pay the tribute that's due,
To the fair *Constellation*, and all her brave crew;
Be Truxtun rever'd, and his name be enrolled
'Mongst the chiefs of the ocean, the heroes of old.

It was fortunate that the infant Navy of the United States received its first baptism of fire under the leadership of an officer of Truxtun's character and professional endowments. He fixed the standard of professional skill at so high a point that mediocrity in seamanship and gunnery could never more be tolerated on board of an American ship-of-war. Nor could any officer of his time have practiced with more telling effect the lesson then inculcated by the government, through the medium of the first Secretary of the Navy, making it the duty of captains "To cultivate among officers and men a love of country, respect for its constituted authorities, a high sense of national honor, and veneration for the flag." And here lies the secret of his great success as a disciplinarian, not arising from the love of power or the spirit of a martinet, but from a just estimate of his functions as a commander and from what might be called a fatherly spirit and habit.[a]

Nor did it lessen the difficulty of Truxtun's task that the first enemy he was to meet was the former ally of the United States, to whom every American had reason to be grateful. Well, therefore did this well balanced and accomplished officer deserve the honors paid him—the gold medal (the second awarded to an officer of the new United States Navy) with its inscribed motto, "Patriæ, Patres, Filio Digno," voted to him March 29, 1800, by Congress, "with the thanks of the nation," the congratulations of foreign officers, the service of silver plate, costing 600 guineas, presented by the merchants of Lloyd's coffee house, of London, and above all, the touching tribute of his gallant adversary, Captain Barreau, of the *Insurgente,* who felicitated himself upon being a prisoner to an officer "uniting in himself all the qualities which characterize a man of honor, courage and humanity."

Although other American officers of note, such as Dale, Barry,

[a] It is a remarkable fact that the punishment of flogging, then so common—limited by the Act of March 2, 1799, to twelve lashes—except in certain cases to be determined by a court-martial—was inflicted only once upon only one sailor during the time that Truxtun commanded the *Constellation.* The law then authorized the use of plain cat-of-nine-tails, and strictly forbade the use of wire.

Decatur and Murray, had commands at this time, fortune favored Truxtun, who was admittedly the best practical exponent, on this side of the Atlantic, of the seamanship of his time. With a splendid record as a seaman in command of letters of marque and private armed vessels, dating back to the first year of the Revolutionary War, and after the peace as captain of Indiamen, he was, when in command of the United States frigate *Constellation*, an acknowledged master of his profession, although during the interval of peace there were no opportunities for practice in naval warfare. Already, in 1794, when he was commissioned captain in the United States Navy, just before he was ordered to superintend the building of the *Constellation* at Baltimore, he wrote a "Treatise on Latitude and Longitude, and the Variation of the Compass,"[a] which gave him the distinction of being the first and only officer in our service, down to 1836, who ventured to write a professional work of any sort. And when at last he had the good fortune to command that ship in the only two frigate actions of the war, he must have felt that he was giving valuable lessons in the most perilous duties of the seaman's art to all his young officers, who then, for the first time, heard the thunder of an enemy's great guns. His mode of fighting the French was that of the most successful English captains—laying the enemy close aboard and coolly awaiting the moment when every shot would tell—and it must be regretted by every admirer of a sea-fight that it was not in the order of events for Truxtun to have met one of King George's most valiant and skillful captains in battle. This privilege, however, was reserved for two of his midshipmen, McDonough and Porter, as well as for others of the same date and school, when elevated to the position of command at a later period. But at the time in question, Englishmen generally were in the mood to applaud any successes of the Americans against the French, which accounts for the gift of silver plate to Truxtun by Lloyd's Coffee House, and for the warm reception given by Nelson's fleet at Naples to Captain Derby of the schooner *Mount Vernon*, of 16 guns, which arrived in that port in 1799, after having beaten a French sloop of war, and escaped from the pursuit of a French fleet sailing under English colors. Apart from political motives, however, such

[a] In 1806, Captain Truxtun published a volume of extracts on naval tactics.

competent judges of seamen and seamanship as Nelson and his captains could not withhold admiration of the skill and success of Truxtun, of the regular navy, and of Derby, the privateer commander. These two types of patriotic seamen in our service—both laboring to build up this arm of the public defense—could fraternize in spirit and social intercourse, unlike the same types in the British service, which even on the sea affected such distant, disdainful terms with each other that co-operation was difficult, if not impossible, except when plunder was the common object.

We dwell somewhat upon the record of Truxtun so as to direct the attention of midshipmen to his professional career. He was undoubtedly the first American seaman of his day, as well as the most considerate of strict disciplinarians, which made him the idol of young men in and out of the service. It was his visit to Charles Biddle's family in 1800 that determined the sons of the latter, James and Edward,* to enter the Navy as midshipmen, and they sailed with Truxtun afterwards in the *President*. The Navy was thus popularized to a great degree in the person of one of its most successful commanding officers. A more singular evidence of his popularity is the fact that General Jackson, a good judge of fighting men, named a favorite horse in Kentucky after Truxtun, making this declaration, "As the commodore stands unrivalled on the sea, so is the horse Truxtun on land, and if the latter should be beaten, I will change his name." Aaron Burr, alluding to this in a letter written from Lexington in 1805, exclaims, "Who would have thought that naval talents were in such estimation at 600 miles from salt water." This very fame of the courageous and high-spirited Truxtun lent color to the attempt made to implicate him in Burr's conspiracy against new Spain. But he resented this charge as warmly as he did the misconstruction put upon his letter to the Secretary of the Navy (Smith) giving up the command of the Mediterranean Squadron, to which he had been appointed, which

*Edward Biddle, although only sixteen years of age, was one of the best mathematicians in the country—perhaps the only person of that day, the celebrated Clairaut excepted, who ever made himself complete master of Sir Isaac Newton's Principia without the help of a tutor. He died of fever on his first cruise. James Biddle was educated at the University of Pennsylvania, entered the navy as midshipman in his seventeenth year and rose to the rank of Commodore. "Autobiography of Charles Biddle," Philadelphia, 1883.

latter injury he wanted to wipe out by challenging the Secretary to mortal combat, according to the custom of that day among gentlemen. In fact, he left the service in 1802 (in which year his friend, Commodore Dale, also resigned his commission) in consequence of this misconstruction, spent the following twenty years in comparative retirement, only once emerging from it to accept the honorable office of high sheriff of Philadelphia, and died in his 67th year, universally respected and regretted."

We are told that Truxtun's ship, the *Constellation*, was not the crack American vessel of her day. This distinction was generally awarded to the 44 gun frigate *United States*—familiarly called "Old Wagoner"—which was renowned "for her discipline and general efficiency, as well as for the long list of distinguished young officers that were trained in her." It may be stated, too, that the crack French frigate of the period was the *Leopard*, Captain La Gallisoniere, which Breck[47] describes as "one of the finest models in the world." This frigate often visited the port of Boston after the revolution, "to escape the hurricanes of the West Indies, as well as to enjoy the friendships and good things of that hospitable city." While anchored there in 1789, near to the British frigate *Penelope*, Captain Lindsey, although the officers of both ships were not on sociable terms, the English frequently sailed around the *Leopard*, admiring her finished naval architecture. On one occasion Breck took on board of the *Leopard* a British midshipman, who expresed surprise at the liberties taken by the French seamen on the sacred quarter-deck, and could hardly contain himself on seeing a sailor, chased by another, dodge his pursuer by jumping behind Captain Gallisoniere on the quarter-deck, whom he seized by both arms, which only elicited from the captain a good natured "What's the matter, my child." After leaving the ship, the irate midshipman, already an embryo martinet, who was a son of Captain Lindsay[48] of the

[46] Commodore Truxtun died in 1822, and was buried in Christ Churchyard, Philadelphia, near to the spot where the remains of his friend Commodore Richard Dale were interred in 1826. It would repay any young officer of our day to visit the simple monuments erected to the memory of these old-time naval heroes.

[47] Samuel Breck's Memoirs. 1771-1862, Philadelphia, 1862.

[48] Captain Lindsay, on retiring from the British Navy, settled near Boston. His son, the midshipman, rose rapidly in rank and commanded large ships in the wars with France. He is said to have been the terror

Penelope, exclaimed in wrath, "Damn them, it's no wonder we beat them." This scene was not new to Breck, who had crossed the Atlantic in 1782, in the French frigate *Iris,* of 32 guns. He tells us that the officers of this ship, including the captain, messed at the same table, and were all "hail fellow well met," even the youngest garde marine addressing his captain in the familiar *tu* and *toi* of intimate companionship. He adds that the discipline on board was lax, and that he witnessed instances when, in the supposed presence of an enemy's vessel, fright operated medicinally upon the sailors. He also states the singular fact that the *Iris,* originally an American ship, built on the Merrimack, of unseasoned timber put together in haste, made the voyage from Boston to the mouth of the Loire in sixteen days, "the very weakness of her hull and frame, by their flexibility, adding to her swift sailing qualities." These glimpses into the interior of French men-of-war of the last century reveal one of the prime causes for the decline of the Navy of France, which was lamented but not prevented by her best statesmen.

At the conclusion of hostilities with France in 1801, many of the captured vessels were restored to her, and the Navy of the United States was reduced by order of Congress to a peace footing.[a] Of the 34 vessels afloat, 14 were retained in the service and the various grades of line officers were reduced to 9 captains,[b] 36 lieutenants and 150 midshipmen, who were, it is to be presumed, the very flower of their respective grades. Between March, 1798, and January, 1801, not less than 354 midshipmen had been appointed, and of these 204 were sacrificed under the new organization. This sweeping reduction of the personnel and material of the Navy, says Cooper, was effected by its best friends to silence the opposition of timid and parsimonious legislators, but never was so embarrassing a duty imposed upon the President of the United States. It placed the navy upon a permanent

of his crew, and on one occasion, when cruising off the Tagus in the *Tiger* of 90 guns, he plunged a knife into one of his sailors who dared to ask permission to speak to him on the quarter-deck.

[a] At the end of Vol. 1, of Goldsborough's Naval Chronicle, published at Washington in 1824, there is a list of officers of the navy before the Peace Establishment law of 1801 was passed, and of those retained in the service after the passage of said law.

[b] The late Rear-Admiral Charles Stewart, for so many years the senior officer of our navy, was the senior lieutenant, and the last survivor of the thirty-six lieutenants of the Peace Establishment.

basis, in accordance with the wise teaching of Washington, and the officers who had the good fortune to retain their commissions "saw a flattering prospect of service before them, and prepared themselves to enter upon their new duties with the confidence and zeal of men who felt that they had fairly embarked in an honorable profession."

An essential feature of the new organziation were the "Naval Regulations issued by command of the President of the United States of America, January 25, 1802." These were copied, as far as they could be adapted to our service, from the "Regulations and Instructions relating to His Majesty's Service at Sea," issued at London in 1734. In the former, we find the obligations of midshipmen defined as follows:

> No particular duties can be assigned to this class of officers.
>
> They are promptly and faithfully to execute all the orders for the public service of their commanding officers.
>
> The commanding officers will consider the midshipmen as a class of officers meriting in a special degree the fostering care of their government. They will see, therefore, that the schoolmasters perform their duty towards them, by diligently and faithfully instructing them in those sciences appertaining to their department, and that they use their utmost care to render them proficients therein.
>
> Midshipmen are to keep regular journals, and deliver them to the commanding officer at the stated periods in due form.
>
> They are to consider it as a duty they owe to their country to employ a due portion of their time in the study of naval tactics, and in acquiring a thorough and extensive knowledge of all the various duties to be performed on board of a ship of war.

These requirements, looking evidently to the future, were all that was then needed for the efficient training and education of midshipmen.[a] Under the Regulations, the chaplain, in addition to his ministerial charge, was to perform the duty of schoolmaster—"to instruct the midshipmen and volunteers in writing, arithmetic and navigation, and in whatsoever may contribute to render them proficient." But we do not find in the records the name of any chaplain in our Navy until 1812, when three appointments to that corps were made, their pay being stated, in the Navy Register for that year, at $40 per month and two rations per day. Opposite to the name of one of them, Andrew Hunter, is a note to this effect—"$20 per month and three rations

[a] The appointment and pay of midshipmen were regulated by the President of the United States at this time.

per day in addition, as mathematician, &c., at the yard at this place" (Washington), which identifies him as the first chaplain who is known to have performed also the duty of a schoolmaster in our service. If this compensation was a measure of the labor involved, it was much more difficult to teach mathematics to irresponsible midshipmen than to preach the gospel to hardened sailors.

The uniform prescribed for midshipmen of the Peace Establishment, although not so gaudy in coloring as that of the Revolutionary period, was more varied and effective, in accord with the increasing importance of the corps, as follows:

Full Dress.—Coat of blue cloth with lining and lappels of the same, the lappels to be short, with six buttons; standing collar with a diamond formed of gold lace on each side not exceeding two inches square; a slash sleeve with three small buttons—all the button holes to be worked with gold thread; vest and breeches white.

Undress.—A short coat, without worked button holes; a standing collar with a button and a slip of lace on each side. Midshipmen, when in full dress, to wear gold-laced cocked hats and hangers, with shoes and buckles. Dirks not to be worn on shore by any officer.

Here we find the first mention of a short coat for midshipmen, together with the insignificant dirk as a side-arm, copied from the British service, the abbreviation of his former service uniform being due, perhaps, to the jealousy of the lieutenants rather than to a sense of fitness of things on the part of the naval authorities of that day. However this may be, the curtailed coat was a decided step towards the jacket—the typical round jacket held in disdain in Revolutionary times, but soon to be adopted for the junior grade of officers of our Navy.

In the conduct of naval operations against the Barbary States of the Mediterranean, undertaken to free our commerce from tribute or assault by such marauders, a large number of young officers of the American Navy—especially the lieutenants and midshipmen—had opportunities for gaining experience and skill in their profession which were afterwards to be utilized in the greater struggle with the mistress of the seas. For the first time the naval powers of the Old World were to witness the appearance in European waters of American men-of-war sailing in squadrons under a flag as yet but little known, with orders to protect American merchantmen at any cost against the assaults of a fierce common enemy.

There is mention of only one of the midshipmen, John Downs, who with Lieutenants Porter and James Lawrence, was reported as deserving of special distinction for his services during the attack of the boats of Commodore Morris' squadron upon a number of vessels in the harbor at Tripoli. But the midshipmen receive frequent honorable mention in the narrative of subsequent stirring events. The arrival in the Mediterranean, in September, 1803, of that eminent seaman and rigid disciplinarian, Commodore Edward Preble—a man born to command—with a squadron of first rate frigates and fast sailing brigs and schooners commanded by Bainbridge, Hull, Decatur, Dent, Somers, Smith and Stewart—all young unmarried lieutenants—and crowded with midshipmen, inaugurated a series of daring enterprises in which the reefers were ever foremost, contending even with their commanders for the palm of heroism. "In this squadron," says a naval writer, "contempt of danger was so rigidly practiced that when a subordinate officer showed symptoms of fear in an engagement, and was tried by court-martial, Commodore Preble assigned for his acquittal a reason no less strange than just, viz.: 'that the bare supposition that one coward existed on board the American fleet was, of itself, a greater injury than the condemnation of this man could possibly be a benefit, as it would establish the fact.'" In such an atmosphere as this, heroism almost lost its distinction, so frequently was it displayed. The whole body of Preble's officers, rejoicing at the prospect of immediate hostilities, pressed forward as volunteers in every hazardous enterprise, and so remarkable were the results that it was customary to speak of the Mediterranean as the "American Naval School." Its matchless discipline, self-devotion, generous rivalry in gallant deeds, and high professional tone, make it a profitable and interesting subject of study to the midshipmen of our day.

In the records of the various events and operations before Tripoli, during the period of Commodore Preble's command in 1804, we find the names of numerous midshipmen who took a prominent part therein, as follows:

For the perilous night expedition under Lieutenant Decatur, to destroy the *Philadelphia*, he was embarrassed by the large number of officers and seamen who offered to join him—of the eagerness of the midshipmen, it suffices to say that he was compelled to take with him in the little ketch *Intrepid*, of 60 tons, besides some

seaman, as many as seven midshipmen, all volunteers, viz.: Ralph Izard, John Rowe, Charles Morris, Jr., Alexander Laws, John Davis, Thomas McDonough, and Thomas O. Anderson, all young officers of merit, and most envied by other midshipmen of the squadron who could not join that almost "forlorn hope." There was also on board the *Intrepid* a slender youth of nineteen, son of a Philadelphia Quaker, who had run away to sea, and begged the privilege of accompanying Decatur, which, after some hesitation was granted. This youth was among the foremost in boarding the frigate and attacking the Tripolitan crew. Every reader of naval history is familiar with the rapid and effective manner in which this handful of young officers fired the captive frigate. For this exploit—the destruction of the frigate *Philadelphia*, which Nelson styled "the most bold and daring act of the age"—Congress voted a sword to Decatur and two months pay to the other officers and to the crew, by resolution of November 27, 1804. Decatur and Midshipman Morris reached the deck of the *Philadelphia* about the same moment, but Cooper states that, owing to Decatur's foot slipping in the spring he made from the fore-chains, Morris first landed on the deck. Both were quickly followed by the others, all fighting their way to the stations assigned them by Decatur, as follows, the watchword being Philadelphia: Midshipman Izard and Rowe on the upper deck; Midshipman Lawrence, Laws and McDonough on the berth-deck; Midshipman Davis in the wardroom; Midshipman Morris in the cockpit and store-rooms; Midshipman Anderson in the cutter of the *Syren*, alongside the Philadelphia.

We can almost see these gallant fellows, after having overcome the Tripolitans on board, coolly setting fire to every part of the doomed ship, according to their instructions, and then sweeping out of the harbor in the *Intrepid* with lusty cheers of joy and defiance, under a heavy fire from the batteries on shore. Decatur, in a sailor's jacket, modestly reported his success to Lieutenant Stewart, who awaited his return in the brig *Syren*, outside the harbor. But the glad tidings were already wafted in columns of smoke and flame to the officers and crew of the *Philadelphia*, imprisoned ashore, among whom were not less than eleven midshipmen, viz.: Bernard Henry, James Gibbon, James Biddle, Richard B. Jones, D. T. Patterson, William Cutbush, Benjamin

F. Reed, Wallace Wormly, Robert M. Gamble, Simon Smith and James Renshaw.[82]

Captain Bainbridge made their captivity useful to the midshipmen by having them instructed daily in mathematics, navigation and tactics, inculcating also such sentiments of patriotism, honor and devotion to the flag as their situation suggested, their teachers being their superior officers, who thus also improved themselves and lightened the burden of imprisonment. It was indeed a novel spectacle to find a captive commodore directing the studies of his young officers, prisoners like himself. It may have been some consolation to these captive midshipmen and their superior officers to witness the necessary destruction of their unfortunate ship, but they must have cursed their unlucky fate when listening to the boom of Preble's guns in his several attacks upon the town and shipping of Tripoli. How unlike in appearance to their well uniformed brother officers in Preble's ships were the poor prisoners, already robbed even of their uniforms, which were exultantly worn in the streets of Tripoli by their piratical jailors. Midshipman Biddle, however, with the luck that often befalls his grade, had saved his boots, in which were concealed a few gold pieces for use in emergencies. Fortunate was he, too, in having brought with him to the Mediterranean letters to the Governor of Malta, Sir Alexander Ball, who kindly sent him a supply of cheese, porter and other welcome additions to the meagre prison fare, all of which he doubtless generously shared with his suffering messmated. It is stated in the "Autobiography of Charles Biddle" (1883), that the question of purchasing the freedom of the prisoners was discussed in Philadelphia, where several of the midshipmen belonged, but such a course was decided to be unwise in view of the well known avaricious character of the Bashaw, and so the matter was left to the result of the blockade, which at last secured the liberty of all the captives, after nineteen months of imprisonment. At one time, however, the father of James Biddle intended to fit out a fast-sailing vessel, taking a cargo for Leghorn or Malta, and after landing it, to proceed off Tripoli in the hope of being able to effect the liberation, at least, of his son. This project too was abandoned. It must never be

[82] Several of these midshipmen, when released from captivity, were made lieutenants and appointed to the command of gunboats on the coast of the United States. Richard B. Jones, however, commanded a gunboat in the harbor of New York, while still a midshipman.

forgotten that to the kindness and sympathy of Consul Nissen, a Dane, representing his country at Tripoli, were the American officers indebted for great alleviation of their misfortune. One of the greatest consolations was the restoration of their books, which were purchased by Consul Nissen from the Tripolitans for a small sum.

Of these midshipmen, Biddle, Patterson and Renshaw rose to the rank of Commodore. Henry, after he left the service, was for a long time United States Consul at Gibraltar, and Jones in his later manhood studied law and rose to the bench as an associate justice.

In the first attack upon the Tripolitan gunboats and batteries, August 3, 1804, six midshipmen were engaged—Ridgely and Miller, with Lieutenant Somers; Thorn and McDonough, with Lieutenant Decatur, and John D. Henley and Deacon, with Lieutenant Trippe.

Midshipman John D. Henley was highly commended in Commodore Preble's report for his services with Lieutenant Trippe, of gunboat No. 6, a flat-bottomed boat of 25 tons, armed with one 24 pounder gun at the bow. Lieutenant Trippe and Midshipman Henley boarded, with only nine men, a Tripolitan gunboat manned by 36 men, of whom fourteen were killed and twenty-two made prisoners, seven of the latter being severely wounded. Trippe received eleven sabre wounds from the long-armed Tripolitan commander, but rejected Henley's offer to aid him in dispatching so brave a man, and finally, finding his own sword blade bent, seized that of the Turk and plunged it into the body of his enemy. In the melee Henley stepped over the prostate body of the dying Turk, who had strength enough left to resent such an indignity by giving a violent twist to the midshipman's ankle—the only injury he sustained in this fierce hand to hand encounter. "A more extraordinary action," says Goldsborough, "was probably never recorded."

Midshipman McDonough's conduct in Lieutenant Decatur's gunboat No. 4 was mentioned in the highest terms, and equally lauded were the services of Midshipmen Ridgely and Miller of Lieutenant Somer's gunboat No. 1.

It was in this attack that the immortal sailor-man, Reuben James, deprived of the use of both his hands by wounds, saved the life of Lieutenant James Decatur by receiving in his skull a

sabre cut aimed at Decatur by a Tripolitan officer. This gallant tar served in all the desperate actions of the Tripoli War, and was with his favorite commander, Stephen Decatur, in the War of 1812, receiving many wounds, in what he was accustomed to describe as "ten fights and as many scrimedges." Dr. Harris, in his "Life of Bainbridge," tells us that James, during his service of 40 years in the Navy, contrived "to have many merry makings by celebrating his own birthday, that of his favorite commander and those of his fights and scrimedges, besides the national anniversaries."

In the second attack against Tripolitan shipping and batteries, August 7, 1804, Midshipman John S. Dorsey, of gunboat No. 9, blown up by a hot shot of the enemy, was commended as an excellent officer. He was killed, together with Lieutenant Caldwell and eight of the crew, but Midshipman Robert T. Spence, who was superintending the loading of the bow gun at the moment of the disaster, succeeded in firing it as the vessel was sinking, he and his gun's crew giving three cheers as she went down. They were happily picked up and lived to fight another day. Captain Stephen Decatur, in command of this expedition, in admiration of Spence's gallant act, urged his immediate promotion, which Commodore Preble was glad to grant. The gallant conduct of the young sailor-captain of the gun, Edmund P. Kennedy, won for him an acting midshipman's appointment, and he afterwards rose to the rank of master-commandant in the Navy with much honor to himself. Young Kennedy, a gentleman's son, of Maryland, ran away from home to go to sea before the mast, and was imprisoned on board a British man-of-war from which he escaped "at the risk of his life by swimming a mile to the shore," and enlisted in the American Squadron before Tripoli. "It is believed," says Cooper, "that this officer and one other, are the only two in the navy who can boast of having gone through all the graduations in the service, from forward, aft."

In all of these hand to hand fights, the agility, skill, and superior knowledge of their weapons, shown by the American officers, was remarkable even in contrast with the swordsmen of the warlike Tripolitans bred from childhood to handle the spear and scimitar.

There were no midshipmen engaged in the expedition of the fire-ship *Inferno,* against the enemy's shipping, under command of

Lieutenant Somers, September 4, 1804, but it was not the fault of the midshipmen that none of them had a part in this most desperate exploit, which will ever stand in history as an example of heroic self-sacrifice, not of an individual, but of a company of brave men.

In the account of the subsequent joint sea and land expedition of three vessels of Commodore Samuel Barron's squadron (April, 1805), with a land force under General Eaton, the American Consul of Tripoli, who agreed to make peace with the United States, we find the names of Midshipmen Mann and Danielson mentioned with credit in connection with the arduous 50 days' march of General Eaton's troops across the Lybian Desert from Alexandria to Derne on the Tripolitan coast, and the capture of the latter place (1806). Towards the close of the fight at Derne, Lieutenant O'Bannon, accompanied by Midshipman Mann, with a few brave fellows, entered the fort, hauled down the enemy's flag, and turned the guns against the town.

Such were the pupils of the so-called "American Naval School" of 1801-5 in the Mediterranean, of the rank of midshipmen and of lieutenants just promoted from the lower grade—all young and so eager to give proofs of manhood and self-devotion that any act of this sort passed almost without notice. "It is looked upon as a duty," says a writer of that period,[*] and is therefore no object for praise." Nor is it to be supposed that the Turkish man at arms, sailor or soldier, whether of Tripoli, Algiers or Morocco, was an enemy to be despised. Upon this subject, a British midshipman of the *Queen Charlotte*, engaged in the Battle of Algiers in 1816, writes thus humorously, but truthfully, to a friend at home: "Turbans and trousers are so like caps and petticoats, that you in England think the Turks and Moors are little better than old women. If you had seen them the day before yesterday, you would have a different opinion of them. Without so much noise and jabbering, they were as active as Frenchmen, and, to do them justice, they pointed their guns with a coolness and precision that would not have disgraced gentlement in cocked hats and pantaloons, and as far as I can judge, there are few Christians who value their skins less than these Pagans. They say they have a funny Paradise prepared for those who die in battle; some of the joys of this pretended Eden we hope to enjoy on our arrival at home;

[*] Abel Bowman, "The Naval Monument," Boston, 1814.

however, 7000 of the poor Mahometans have gone before us. The grief of the story is that we had no officer killed, so no promotion. The Dey's balls seem to have the navy list at heart, and took care to avoid hitting everybody who would have made a vacancy." Another midshipman describing the same battle remarked: "Some say the Battle of Algiers was at times hotter than Trafalgar itself—one of our lieutenants who was in that action is of this opinion. In comparison with the numbers employed, it was the bloodiest action fought in late years."[54].

It is hardly necessary to say that Commodore Preble's young officers held in high honor and esteem the master and teacher who had won his first fighting laurels as a lieutenant in the Revolutionary War, and his later fame as a seaman—commander in the merchant service, and who now, as commander-in-chief of a squadron of armed vessels gave an example of discipline and duty in war, which, like that of Truxtun in the French quasi-war, inspired his subordinates to heroic deeds. Well indeed did Preble deserve the encomiums of his officers, the gold medal with this inscription, "Comitia Americana Edwardo Preble, Duce Strenuo," awarded by vote of Congress, March 3, 1805,[55] and the distinction of being the first commanding officer in the United States Navy who received the thanks of the citizens of the United States by their Representatives and Senators in Congress assembled. Had he remained in command of the squadron, he probably would have had the satisfaction of effecting the release of his imprisoned brother officers.

Most fitly, too, did Congress in the Resolution of March 3, 1805, deplore the loss of Lieutenants Richard Somers, Janmes Caldwell, James Decatur, Henry Wadsworth, Joseph Israel, and of Midshipman John S. Dorsey, who was honored by Congress with a special resolution of condolence and thanks for his gallantry in the said attacks, being the second officer of his grade thus honored. The fame of these officers was perpetuated in a marble monument erected to their memory by their surviving brother officers in the Washington Navy Yard in 1808. There it was sadly defaced by the British during their brief occupancy of that city in 1814. Some years afterwards it was removed to the

[54] The British Naval Chronicle, London, 1816.

[55] Captain John Paul Jones was the first officer of the Continental Navy honored by Congress with a special vote of thanks.

grounds of the Capitol, and finally in 1860, by direction of Congress, it was removed thence to the grounds of the Naval Academy, where it still stands most appropriately as a reminder to each generation of naval cadets of the honors to be won in the profession by daring and devotion to duty. The same resolution of Congress authorized the giving of a gold medal to Commodore Preble, a sword to each of the commissioned officers and midshipmen who had distinguished themselves in the several attacks against Tripoli, and one month's extra pay to petty officers, seamen and marines of the squadron. Up to 1813, only the first and last of these objects had been carried into effect, but the swords were never given.

Peace was declared June 3, 1805, and the patriotic feeling of this period was expressed by Joel Barlow, then living in Washington, in the poem entitled "Columbiad," which many of its readers regarded as the poem of the future, but it is hardly known to the present generation.

Even at this early period the naval resources of the nation formed the theme of poetic admiration, as appears from the poem of David Humphreys[58] on "The Happiness of America," published in 1804:

> Where lives the nation fraught with such resources,
> Such vast materials for a naval force?
> Where grow so rife the iron, masts and spars,
> The hemp, the timber, and the daring tars?
> Where gallant youths, inur'd to heat and cold,
> Through every zone, more hardy, strong and bold?

It is worthy of note that a large number of the midshipmen of 1798 and 1799 were lieutenants in 1801, although mere boys in years, and that some were advanced even more rapidly and obtained commands in Preble's squadron before the close of the Tripolitan War, literally fighting their way from the steerage to the cabin or to a glorious death. It is difficult to realize that Perry, O. H., was a lieutenant at seventeen (and only twenty-one when he won the Battle of Lake Erie), and Charles Stewart at nineteen. The daring Somers was a lieutenant in less than a

[58] David Humphreys foresaw the great destiny of the United States as a maritime power. He declared that no other nation was then so capable "of giving lessons in maritime affairs," recommended the establishment of a Naval Militia, and that the glory of the starry flag should be made the subject of many a patriotic song.

year from the date of his midshipman's warrant, and in the fifth year of his service obtained command of the memorable expedition in which he sacrificed his life. Bainbridge entered the Navy in 1798, as a lieutenant, had command of the *Retaliation*, of 12 guns in the same year—was commissioned post-captain in 1800, before he was twenty-six. Champlin, of the *Scorpion*, was twenty-one; Turner, of the *Caledonia*, twenty-two (Battle of Lake Erie). But the most remarkable instance of rapid promotion, probably in any naval service, was that of Stephen Decatur, a midshipman of 1798, who was a lieutenant in 1799, was appointed to the command of the frigate *Constitution* in 1804—and hoisted his pendant as commodore on board the frigate *Chesapeake* in 1808, in the twenty-ninth year of his age. It was on board of his flag-ship, the *United States*, in 1810, that he addressed to Midshipman McCauley (nephew of his friend, Captain Charles Stewart), reporting to him for duty, the remarkable words which are here repeated as an encouraging stimulus to the future admirals of our navy who are now impatiently toiling through the ordeal of academic apprenticeship: "Young gentlemen; you see my pendant aloft there. Well, I joined this very ship only twelve years since, a midshipman like yourself, and you see I now carry a broad pendant in her."[81]

The rapid rise of the new American Navy, during the Tripolitan War, to some degree of fame, aroused among certain British Army and Navy officers unworthy feeling of jealousy, which found expression in insulting sneers and overbearing manner whenever they happened to meet our officers at Malta, Port Mahon or Gibraltar. This, of course could not be meekly borne by high-spirited Americans, proud of their professsion, so that they determined to teach the braggarts a lesson not to be forgotten. Mackenzie in his "Life of Decatur," relates the affair that took place in January, 1803, between Cochran, an English officer and a professed duellist, secretary of Sir Alexander Ball, Governor of Malta, who used insulting language, and Midshipman Joseph Bainbridge, who promptly knocked down the offender. A duel

[81] Nelson received his post rank in the British Navy in the ninth year from the date of his entry into the service as a midshipman, and in the twenty-first year of his age, being, however, eight years younger than Decatur, when the latter was made a captain. The great Farragut of our navy had served forty-one years before he got his promotion as captain, owing to the effects of a long peace.

ensued, at four paces, with pistols, in which Cochran was killed at the second fire by Bainbridge, who had declined the urgent request of his second, Lieutenant Decatur, to be permitted to act as principal. The hot-headed Decatur himself had already been concerned in an attempt to avenge an insult by a Spanish naval officer at Barcelona, a meeting being prevented by the interference of Captain Bainbridge and the Spanish captain-general. He also had an affray with a British officer at Malta, for which he was suspended from duty for a short time. Other encounters and duels followed until finally American officers enjoyed as much consideration as their ships in the Mediterranean. Nor were they less sensitive or less ready to fight upon points of honor among themselves. Lieutenant Somers, it appears, before he made his brilliant record under Commodore Preble, challenged every officer of his mess for having doubted his courage in connection with a hasty word addressed to him by his devoted friend, Decatur. He fought three of his messmates successively in one day, was wounded twice, and was obliged to fight the third man seated on the ground with Decatur's arm around him. Indeed, the fighting spirit was encouraged among the young officers of that day as a means of creating a proper *esprit de corps*, and giving an example of manly bearing to the green crews that fought our battles on the sea. But Commodore Preble put a stop to the practice by stern discipline, so that he was enabled to report at the end of his term of command in the Mediterranean that there had been neither a duel nor a court-martial in his squadron. Soon after he was relieved, however, a duel took place between Mr. Dehart and Mr. Nicholson, of the American Squadron, in which at the third fire Nicholson was shot through the head and died instantly (February, 1805). The practice of duelling was continued in the service with more or less frequency down to 1845.

At the close of the Tripolitan War (June, 1805), sixty-nine midshipmen, presumably the pick of the corps, were promoted to the grade of lieutenant, thereby infusing new vigor into the latter body and giving hope to the former of speedy promotion. Even at that early period there was something in the air foreboding a war with England, which was regarded as inevitable from the date of the attack of the British frigate *Leopard* upon the American frigate *Chesapeake* (June 22, 1807), and it was therefore very important that there should be no falling off in the

discipline and spirit of the junior grades of officers who had deserved so well of their country. In this unprovoked attack the only officers wounded were Captain Barron and Midshipman James Brown, of the *Chesapeake,* which fact in all probability was remembered by his messmates and by the whole corps of midshipman when the war was subsequently declared. The lieutenants of every naval personnel constitute its soul—the vital element out of which captains are made and into which midshipmen are transformed. To the lieutenants, who are near them, rather than to the captains, who are far above them, the midshipmen look for inspiration and example, and whatever tends to weaken or demoralize this element, injures the entire personnel. If Hamilton's scheme of a combined military and naval school had been carried out, the corps of midshipmen would have furnished better trained material for the next higher grade, and insured the latter against the possible loss of prestige when the incentive of war had ceased to exist.

In March, 1808, an effort was made by Colonel Jonathan Williams, superintendent of the Military Academy at West Point, to revive, in a modified form, the scheme of Hamilton. In a report[m] to the Secretary of War upon the actual condition of the academy, described as a "foundling barely existing among the mountains and nurtured out of sight of its legitimate parents," Colonel Williams suggests its removal to Washington, and in submitting a plan for its improvement, he wisely added: "It might be well to make the plan upon such a scale as not only to take in the minor officers of the navy, but also any youths from any of the States who might wish for such an education, whether designed for the army or navy, or neither, and to let these be assessed to the value of their education, which might form a fund for extra or contingent expenses." This report was communicated to Congress, with his approval, by President Jefferson, who, in relation to the proposed transfer of the academy to Washington, said: "Besides the advantage of placing it under the immediate eye of the government, it may render its benefits common to the Naval Department, and will furnish opportunties for selecting on better information, the characters most qualified to fulfill the duties which the public service calls for." Both of these statesmen were

[m] American State Papers—Military Affairs, Vol. 1, p. 228.

in accord in their desire to benefit the midshipman,[88] and a bill to accomplish the object was introduced in the Senate, but it was not even taken up for consideration. This neglect, however, did not affect the professional spirit of the corps, as we find them most zealous in the discharge of the perilous duty of capturing piratical vessels off our Southern coast in 1810-11. One of the midshipmen, F. H. Gregory, in command of several man-of-war boats and of gunboat No. 162, of 5 guns, captured not less than seven of these piratical craft at different points, viz.: The *Diomede, Alexandria, La Franchise, Santa Maria, La Sophie, La Vengeance, La Divina Pastora,* some with slaves on board, and each carrying from 4 to 6 guns.

At this period the world had been electrified by the great naval victories of Jarvis, Exmouth, Collingwood and Nelson, who had no warmer admirers of their great skill and bravery than the young heroes of our small Tripolitan War. It may be presumed that the latter, ambitious of preparing themselves for greater struggles, made a study of these events, but the government at Washington only saw in them reasons for placing our navy upon a safe footing. As a means to this end, the gunboat system of coast and harbor defense was inaugurated by Mr. Jefferson in 1805. It was a veritable mania, having for its object the extinction of the heavy and costly frigates and sloops of war previously employed. In fact, it was the beginning of that timid policy which nearly lost us all the glories of the succeeding war. These gunboats are described as long, low, narrow craft, modeled after French and Neapolitan ideas, generally sloop-rigged, and armed with one or two of the new 32 pound carronades. They afforded the government an opportunity of giving commands to young officers, which made them popular for awhile. Indeed, a large number of the newly made lieutenants were put in command of them and two midshipmen were assigned to each, with the prospect of command in time, of one of the ever increasing number of these amphibious galleys.[89]

But we have it upon good authority that this economical navy

[88] The Act of January 31, 1809, authorized the employment of three hundred midshipmen.

[89] In 1899, there were not less than 176 gunboats afloat between Portland and New Orleans, and on the lakes, and a total of 227 were authorized by Congress to be built. Lossing gives a sketch of some of these gunboats in his "Field Book of the Revolution."

lowered the tone and efficiency of the service to such an extent that its discontinuance and the sale of the boats were advocated by the best friends of the service. It was mercilessly jibed and ridiculed by the Federalist wits and satirists in the daily press or monthly magazines of the day, and seemingly with sufficient cause. One of the most ludicrous of the short squibs was the following, anonymous:

LULLABY FOR LITTLE DEMOCRATIC BABIES, BY A FEDERALIST.

In a cornfield high and dry,
Sat a Gunboat No. One,
Wiggle, wiggle went her tail,
And *pop!* went her gun.

A more pretentious satire was that penciled by T. G. Fessenden, who feared not to sign his name to it in the pages of the "Boston Palladium" of 1805:

ON THE JEFFERSONIAN NAVY.

Our Gunboats! Themes of admiration,
To every seaman in the Nation,
The very essence in reality
Of vast Philosophisticality![a]

One round half dozen, I've a notion
Would carry terror through the ocean,
And *eight* or *ten*, in my opinion,
Would give us Neptune's whole dominion!

Should Britain come with all her shipping,
Good Lord, we'd give her such a whipping!
She'd wish the navy of her island,
Had been just twenty leagues on dry land,
Before she'd impudence to enter
On such a perilous adventure.
* * * * * * * * *
* * * * * * * * *

Lord, only think what might be done
With this trim Gunboat No. One!
From Washington she sails in might,
With head and tail, "chock full of fight."

Abash'd Potomac hides her head,
Neptune's half petrified with dread,
And awe and admiration wrapt in
Resigns his chariot to the Captain.

[a] This was a hit at the new Jeffersonian School of Philosophy.

Now, Gallant No. One by chance
Meets England's fleet combined with France,
Is soon prepared at both her ends,
Stand clear all rogues, *except our friends.*
Now comes the fleet in line of battle,
The heavens re-bellowing cannons' rattle,
Each smoke-envelop'd grand first rater,
Seems like the mouth of Ætner's crater—
Pop! goes our gun, like Plutar's mortar!
Splash!—there they are—all under water!!!
Not quicker struck by Jove's own thunder,
Did earth-born Titans erst knock under,
Than these when hit by their superiors,
From Gunboat No. One's posteriors.

The third and best school of naval training during this belligerent period of our history was the War of 1812-15 with England called by some English writers the "Second American War." Here we find a new class of ships, better artillery, a new American method of firing heavy guns in action, the development of a system of tactics, and a body of most accomplished seamen in command, who, although unconscious of playing the role of teachers when engaged in battle, certainly imparted most valuable instruction as well as an example by which their juniors greatly profited. It was a tremendous task that they undertook, to free our commerce and seamen from the vexatious police supervision of the seas which England had long assumed and exercised with haughty airs and unrighteous methods. In this war-school we find also a body of midshipmen, 450 strong, made up of a small number appointed in the years succeeding the Tripolitan Wars (some of whom had already become acting lieutenants and masters during the war with England), and of a very large number of youths admitted into the service without any previous experience afloat. Their commanders were almost all young, self-taught seamen, who had won their epaulets in the "Mediterranean School." "During the eight years of peace preceding the War of 1812, many of them," says Captain Charles Stewart, one of the most distinguished of the number, "maintained by voyages of exploration or trade, practical arts and vigilant habits of navigation. When, therefore, the summons to battle sounded again in June, 1812, the naval officers of the United States pressed eagerly forward with unbroken spirit, unshaken fidelity, and undiminished professional ability." Trained under the exper-

ienced eyes of Truxtun, Barry, Dale and Preble, "these young commanders were possessed of a knowledge of marling spike seamanship and the evolutions of single vessels under canvass that had reached the acme of perfection. Every commissioned officer was a practical sailor, in whose eyes a want of knowledge of the most minute details of the rigging and maneuvers of a ship in every conceivable emergency was a disgrace, associated in its magnitude with timidity in battle." "Every naval man of spirit," say a contemporary writer, "is an enthusiast." It is not to be wondered at, therefore, that when the government hesitated to engage in this contest with the powerful Navy of England,[*] "the whole body of our captains, speaking through Stewart and Bainbridge, resolutely pleaded for permission to meet the enemy ship for ship, or whenever in their judgment there was a chance for a fair fight." They knew that ship for ship, our little Navy was equal to any afloat. These were men of the right caliber to build up the Navy of the United States, and to settle for all time the great question of the free navigation of the high seas. Their arguments and solicitation prevailed at Washington, but "so fearful were they," says Cooper, "that the timid, wavering policy of the Cabinet might at the last moment revoke their orders, that they hurried off to sea without any organized plan of operations and in some cases without sufficient preparation." In fact, we know that Commodore Rodgers put to sea from New York with his little squadron in less than an hour after he received his orders and the official declaration of war, and had the honor of firing the first hostile shot with his own hand on the fifth day thereafter.

That this high resolve and impatience of the commanding officers was shared by the midshipmen is evident from the very large number of young lads who besieged the Navy Department for warrants. The mere possibility of war in the three previous years drew into the corps nearly 200 youths, among whom were Shubrick, Farragut, Percival and Tattnall, but in the year 1812 alone, one hundred and fifty-nine midshipmen were appointed, of whom not less than eighty-three entered the service on the

[*] Cooper's Naval History: "In 1812, the Navy of Great Britain nominally contained a thousand and sixty sail, of which between seven and eight hundred were efficient cruising vessels. The United States had but seventeen cruising vessels of war, of which nine were of a class less than frigates."

memorable 18th of June—the day on which war was declared. In 1813, fifty-four warrants were issued, and in 1814 twenty-six, when the complement of the grade was filled. Of the whole corps about two hundred and fifty entered the service during the war, without any previous experience at sea or knowledge of naval affairs, among whose names we find the familiar ones in our naval history of Ingraham, Marston, Latimer, Stackton, Stringham, Sands (J. R.), Conover, Aulick, Barron (Samuel), Bell, Engle, Long, McKean, Smoot, Forrest, Rousseau, Buchanan, Stribling, Goldsborough, and others well known to the generation of officers now passing away, the three last named being particularly remembered by graduates of the United States Naval Academy at Annapolis, of which they were the first, third and fourth superintendents respectively.

As might be supposed, there were not armed vessels enough in the Navy of this period for even half the number of midshipmen, so that it became necessary, during the war, to make frequent changes in the detail of this class of officers, in order to give all an opportunity for instruction in their profession. Moreover, as the issue of the contest was to be decided mainly by skillful gunnery, great attention was paid to this exercise from the opening of hostilities. The first lieutenant of every ship in commission (in special charge of gunnery practice) exercised the crew three times daily at general quarters, with the frequent addition of target practice and night alarms at anchor and underway, which speedily gave to both officers and sailors confidence in themselves and in their weapons. The result of this frequent gun-practice was *strikingly* shown in the actual engagements that followed There were naval duels between single ships on the high seas, and general engagements between squadrons of small vessels on the lakes, in which history records that the officers in command displayed skill in tactics and great boldness in attack. Even when a single American frigate was chased by a squadron of the enemy, the same superior nautical skill and facility of resources was displayed. It must also be added that with rare modesty and justice they attributed their victories in great part to the care taken by the first lieutenants in gunnery and practice, as well as to the courage and discipline of the officers and to the docility and fighting spirit of their young crews. In this connection Captains Hull, Jones, Decatur, Bainbridge, Lawrence, Burrows, Warring-

ton, Blakeley, Perry, McDonough, Stewart and Chauncey were outspoken in praise of their first lieutenants, Morris, Biddle, Allen, Lawrence, Shubrick, Ballard, McCall, Nicholson and Reilly.

The method of attack deliberately carried out by the American captains was first to endeavor to cripple or dismantle the enemy and then "force the fighting at close quarters." Bowen, in the "Naval Monument" (1816), describing the rapidity with which the *Frolic* was disabled by the *Wasp*, says "the American therefore fired as the ship's side was going down so that the shot hit either the enemy's deck or below it; while the English fired as the vessel rose, and thus their balls chiefly hit the rigging or were thrown away." Or, as an anonymous writer of 1868 better expresses it, "The Americans made the hull and decks the chief objects of aim, laying the guns generally level with the plane of the deck and firing from the top of the wave, watching carefully the lee and weather rolls of the ship. The British gunners, on the other hand invariably opened fire at long range, and paid so much attention to their breech and dispart sights, to estimates of distance, &c., that much time was lost in elevating and depressing the guns without regard to the angles of the pitching motion or the lurches of the ship." This marked difference in the mode of firing accounted in great measure for the greater damage and loss of life sustained by the English. This and many other valuable lessons in gunnery, seamanship, tactics and general naval proficiency made up a practical text-book compiled and illustrated by our captains during the course of this war of great surprises. It was the only naval text-book then available for the junior officers, and surely nothing could have been more instructive and inspiring.

Of the large number of midshipmen who learned the elements of their profession at that period, none had better opportunities than the fifty-three who served at different times in the frigate *Constitution*, the rival of her sister ship, *Constellation*, in good fortune as well as in sailing and fighting qualities. It was in this crack frigate, modelled by Humphreys, that Hull, "in the masterpiece of nautical skill and seamanship, combined with tactical strategy of the whole war," taught his fifteen midshipmen how to save a ship from capture by a closely pursuing squadron (Broke's), and, later, how to dismantle and dismast a frigate of the enemy, *Guerrière*, in a yard-arm fight of short duration. It was in her, too, that Bainbridge taught his twenty-one midship-

men how to pick to pieces an enemy's frigate, *Java*, without losing a spar of his own ship, and the dauntless Stewart taught his seventeen midshipmen how to fight and capture two enemy's ships, *Cyane* and *Levant*, in a night action, performing also the very difficult nautical feat of raking them without being raked in return.

The *Constitution*, in fact, passed unscathed through three glorious actions and two critical pursuits, and well deserved the fitting and familiar appellation of *Old Ironsides*, by which she has been written and spoken of ever since. "In all her service," says Cooper, "as well before Tripoli as in this war, her good fortune was remarkable. She never was dismasted, never got ashore[a] or scarcely ever suffered any of the usual accidents of the sea."

Bowen states that in her action with the *Gurrière*, the *Constitution* was hulled three times, with the *Java* four times and with the *Cyane* and *Levant* thirteen times, but the Lord only knows how often she hulled her enemies. "In her three victories, she captured 154 gun carriages, made upwards of 900 prisoners, killed and wounded 298 of the enemy, and the value of the property captured by her, including stores, provisions, &c., cannot be estimated at less than $1,500,000." When she visited Portmouth, England, previous to the War of 1812, she excited little or no interest in that great naval port, much to the surprise of her officers, who knew that the English had nothing like her. But at Cherbourg and the Texel she was critically inspected and admired by all scientific and professional men. This was the man-of-war afterwards sneeringly described by the enemy as "a bunch of pine boards sailing under a bit of striped bunting," but history records how forcibly her gallant officers and sailors thrice hurled back the taunt in broadsides of iron—which, it appears, had been going out of fashion in the British Navy. In truth, she was always well commanded and officered, which accounts for much of her good fortune in war and peace. Every officer and sailor who had sailed in her during the war was proud of her achievements, and those who succeeded them in the long years of her peaceful ser-

[a] The *Constitution* was almost entirely rebuilt in 1874, and her good fortune continued until 1879, when on her voyage homeward from Havre (whither she had borne America's contribution to the Paris Exhibition) she got aground in a fog on Bullard Point near Sivanage, on the English coast, and was hauled off with slight damage by the British Iron-clad *Warrior*.

vice felt the influence of her war record under the obligation that nobility imposes in certain cases, and took special delight in singing in chorus the old sea-song which to this day, that is in 1845, is heard in the school and training ships of our navy, as follows:

THE FRIGATE CONSTITUTION.

Argo of Greece that brought the fleece
To the Thessalian City,
As we are told by bards of old
Was sung in many a ditty;
But Yankees claim a prouder name
To spur their resolution,
Than Greece could boast and do her most—
The frigate *Constitution.*

When first she pressed the stream's cold breast,
Hope hail'd her pride of story;
Now she o'erpays hope's flattering praise,
By matchless deeds of glory;
Of all that roam the salt sea's foam,
None floats to Neptune dearer,
Or fairer shines in fame's bright lines,
Or more makes Britain fear her.

Neath Hull's command, with a tough band,
And nought beside to back her,
Upon a day, as log-books say,
A fleet bore down to thwack her;
A fleet, you know, is odds or so,
Against a single ship, Sirs;
So cross the tide, her legs she tried,
And gave the rogues the slip, Sirs.

But time flies round, and soon she found,
While ploughing Ocean's acres,
An even chance to join the dance,
And turn keel up, poor Dacres;
Dacres 'tis clear, despises fear,
Quite full of fun and prank is,
Hoists his ship's name in playful game,
Aloft to scare the Yankees.

On Brazil's coast she rul'd the roast
When Bainbridge was her Captain;
Next hammocks gave, made of the wave,
Dead Briton's to be wrapped in;
For there in ire 'midst smoke and fire,
Her boys the *Java* met, Sirs,
And in the fray, her Yankee play,
Tipped Bull a *Somerset,* Sirs.

Next on her deck at Fortune's beck,
The dauntless Stewart landed;
A better tar ne'er shone in war,
Or daring souls commanded;
Old Ironsides now once more rides,
In search of English Cruisers;
And Neptune grins, to see her twins,
Got in an hour or two, Sirs.

Then raise amain the joyful strain,
For well she has deserved it,
Who brought the foe so often low,
Cheered freedom's heart and nerved it;
Long may she ride, our navy's pride,
And spur to resolution;
And seamen boast, and landsmen toast,
The frigate *Constitution*.

This song was first sung before the Corporation of the City of New York, July 4, 1815, by Francis Arden. It was published in Frost's "Book of the Navy," 1842.

It will hardly be believed that some years ago a Secretary of the Navy—a stranger to the feeling which she evokes in every professional breast, issued an order to dismantle and sell her under the hammer. This order provoked much indignation among patriots and poets, and one of the latter, Dr. Oliver Wendell Holmes, by a happy inspiration, succeeded in arousing public opinion and saving the frigate by the stirring poem beginning with these lines:

Aye, tear her tattered ensign down,
Long has it waved on high, &c.

Many other lessons of this war in seamanship, tactics and gunnery might be mentioned, such as Decatur's brilliant victory in the staunch frigate *United States*, the fierce actions of Lawrence and Biddle in the *Hornet*, of Blakeley and Jones in the *Wasp*, of Warrington in the *Peacock*, and the most adventurous cruise and bloody battles of Porter in the *Essex*. This dashing seaman, resembling in spirit and character John Paul Jones of Revolutionary fame, taught his lieutenants and midshipmen how a commander thrown upon his own resources in time of war, could take his ship (the *Essex*, of 32 guns) thousands of miles into an enemy's sea (the South Pacific Ocean) at the risk "of capture, blockade, and starvation," and maintain himself there for a year (March,

1813--March, 1814) capturing valuable prizes and enforcing the doctrine of "free trade and sailors right," for which the war was waged, and finally in "the inevitable hour of capture" defending his ship with dauntless courage in a bloody fight of two hours and a half against a superior force of two antagonists before surrendering to them. He also taught his young officers a lesson in manly dignity in his courteous reply to the brutal challenge of Sir James Yeo, of the Southampton frigate, one of his antagonists. Still more instructive to the students of naval warfare were the efforts of "our little navy" in squadron fighting on the lakes, under Perry, McDonough and Chauncey. For the first time, naval tactics, in a limited sense and of an elementary sort, became a subject of study among our commanders, who must have felt that success in this broader field of action would exercise a greater influence upon the issue of war than the isolated duels that were fought between single vessels on the Atlantic. Surely Perry's bold and judicious expedient of breaking the enemy's line at the Battle of Lake Erie—the maneuver identified with the names of the Earl of Sandwich and Rodney in English Naval History—was not only an instructive lesson to his officers, but also a significant warning to the enemy that the youngest of the naval powers was rapidly making itself equal to almost any emergency in battle.

It may not be inappropriate to repeat here the fact, as an illustration of progress in shipbuilding, and of the spirit of the shipbuilders, that many of our fighting vessels on the lakes were hastily constructed of timber that had been growing green in the woods only a few weeks previously. The master hand that effected such rapid transformation was that of Henry Eckford, the only scientific shipbuilder in the United States at that day, to whom much of the credit of the success of the American commanders on the lakes was due.

In May, 1814, he launched the frigate *Superior,* of 66 guns (Chauncey's flag-ship), at Sackett's Harbor, just eighty days after her keel was laid. In 1822, he constructed the steamer *Robert Fulton,* which made the first successful voyage under steam to Havana, and when altered into a sailing vessel became the fastest corvette in the Brazilian Navy. Eckford constructed all his ships from designs on paper, no wooden models having been used in the United States until after the war, 1816, when

under his auspices "it became a feature peculiar to American shipbuilding." In 1820, this remarkable man entered the government service as Naval Constructor at the Brooklyn Navy Yard, and designed the line of battleship *Ohio* and frigate *Hudson*. Later, by invitation of President Andrew Jackson, he furnished a plan for the reorganization of the navy, many valuable features of which were adopted. He also projected a text-book on Naval Architecture, and set aside $20,000 of his well earned fortune to endow a professorship in that branch of science in Columbia College, New York (which good intention, however, was frustrated by the loss of his fortune in a commercial disaster). In 1831, he built a sloop of war for Sultan Mahmoud, at whose invitation he became chief Naval Contructor of the Turkish Empire, but he died suddenly at Constantinople in 1832, in the fifty-seventh year of his age, and was buried at Hempstead, Long Island.

It is worthy of notice too, that in the first quarter of a century of the nation's independent existence, three scientific mechanics of superior ability—Humphreys, Fulton and Eckford—appeared in the nick of time with improvements and novelties in naval architecture and equipments, with new applications of scientific principles to naval affairs and with new weapons and machines of war, long before the great era of invention.

Fortunate were the country and the naval service to have had the aid of such minds and men just when they were wanted, and it is believed that the Republic will have in every emergency of the future other such minds and men competent to carry out her policy and purposes.

It was Eckford, who, when the British had brought into Lake Erie the *St. Lawrence*, a three-decker, of 120 guns, was ordered by the government to build a vessel to meet her in battle. In thirty-five days from standing timber he built a noble craft (the *New Orleans*), 3200 tons burden and pierced for 110 guns. It only remained to put in the spars and rigging when the news arrived that peace had been concluded at Aix-la-Chapelle. For nearly three-score years and ten thereafter, she remained at Sackett's Harbor, an unfinished relic of the war, so staunchly resisting the attacks of time that, even when at the last she had to be broken up, many of her beams were still sound and strong.

In the published official and historical records of the various

naval operations of this war, we find the names, deeds and casualties of the midshipmen engaged therein, and in some cases only casualties without the names of the sufferers, as appears in the chronological order of events:

June 23, 1812. A midshipman of the *President* (name not given) was killed by a plunging shot from the stern gun of the *Belvidera,* thus being the first officer of the United States Navy who lost his life after the declaration of war.

Commodore Rodgers despatched his report of the cruise to the Secretary of the Navy by the hands of Midshipman Walter Newcomb, whom he commended to the notice of the Secretary as "an intelligent young man, capable of giving such further information as may be deemed of moment."

August 13, 1812. Capture of H. M. sloop *Alert,* 20 guns (Captain Langhorne), by the U. S. S. *Essex,* 32 guns (Captain David Porter).

In the account of this initial engagement of the war, off the Grand Banks, called a "skirmish" by Porter, but which resulted in the capture of the first man-of-war of the enemy taken by "our little navy," besides being a speedy retaliation for the capture of the United States brig *Nautilus* by a British squadron (July 15, 1812), only one midshipman of the *Essex,* David G. Farragut, is mentioned, although it is quite certain that Midshipmen Ogden, Isaacs, Terry, Lyman and Duzenbury, named in later dispatches of Porter, were also present. Farragut was only nine years of age when he joined the *Essex* (in 1810), and it will be seen that even in his midshipman days the spirit of the future great naval commander had begun to manifest itself. While the *Essex* was lying in Newport, Rhode Island, in the early part of 1812, repairing damages caused by getting ashore near the Second Beach, young Farragut and his messmates were sent daily to a school on Long Wharf, kept by Mr. Allen, a retired shipmaster, who taught these youngsters the elements of navigation. Nothing could better demonstrate Captain Porter's paternal care of the midshipman, who were soon to give him most efficient support in battle, than his interest in their professional education.

August 19, 1812. Capture and blowing up of the *Guerrière,* 38 (Captain Dacres), by the *Constitution,* 44 (Captain Isaac Hull), off the coast of New England.

In this engagement there were fifteen midshipmen present, as

follows:" Ambrose L. Field, Henry Gilliam, Thomas Beatty, William D. Salter, Lewis Germain, William L. Gordon, Frederick Baury, Joseph Cross, Alexander Belcher, William Taylor, Alexander Eskridge, James W. Delancy, James Greenleaf, Allen Griffin, John Taylor.

They had already participated (July 17, 1812) in the memorable and successful escape of the *Constitution* by the masterly tactics of Captain Hull, from the clutches of Commodore Broke's squadron, but the encounter with the *Guerrière* was their first battle, and what a thrilling spectacle it was to see a noble frigate entirely dismasted and so completely riddled by artillery that it was necessary to blow her up. Twelve of the thirteen midshipmen had the good fortune to be present in the later action of the *Constitution* with the *Java,* which, together with the two preceding events happening within a short period, furnished a volume of practical instruction in naval warfare, as useful to the young officers of the *Constitution* as it was astounding to the enemy. In the fight with *England's Guerrière,* as she was proudly called in the English sea song, known by the name of "Halifax Station," there was much wary maneuvering and upwards of an hour's distant cannonading before the two ships were brought to close quarters, and then both bore off before the wind, within a pistol shot of each other, keeping up a running fire for nearly an hour in the most inspiring manner. Even the most prejudiced of British naval historians admit patronizingly that "Considering the opinion which the Americans then entertained of a British frigate, Captain Hull deserved credit for bearing down upon the *Guerrière.*" It appears, too, that Hull wore his epaulets on this occasion, a conspicuous target for the enemy, but he was not even scratched. The result of his fire, however, is known to every reader of naval history, and it was both forcibly and literally told in the lines of the old American sea song:

Isaac did so maul and rake her,
That the decks of Captain Dacre
Were in such a woeful pickle
As if death with scythe and sickle
With his sling or with his shaft
Had cut his harvest fore and aft.

"In the "Life of Bainbridge" allusion is made to Lieutenant Aylwin of the *Constitution,* who died of his wounds in action with the *Java,* and who had been promoted to lieutenant for his gallantry and good conduct in previous action with the *Guerrière.* His name is not given in this list.

What a career was that of Hull's first lieutenant, Morris, who as a midshipman was with Decatur in the attack upon the *Philadelphia*, and with Hull in the marvelous escape of the *Constitution*, and now with the same captain in the fight with the *Guerrière*—laboring unceasingly to acquire nautical information—a student as well as a fighting man of the first water.

A writer in the Naval Chronicle of that day states that a British song, the "Retort Courteous," intended to be a reply to the Yankee song, "Rodgers and Decatur," published in the Chronicle, lost its point by the capture of the *Guerrière*, "and was held back until Dacre was white-washed by court-martial for the loss of his ship." After this fight the British critics agreed that the Americans were second to none but the British tars, but Dacre was so harrassed by the carping remarks of his brother officers at Halifax, that he challenged five, fought two and killed one of them (Captain Stockpole), and would have continued thus to defend the necessity for his surrender to Hull, if he had not been prudently sent home.

October 18, 1812. Capture of H. M. sloop *Frolic* (Captain Whingates), by the U. S. sloop *Wasp*, 18 (Captain Jacob Jones), off the Bermudas.

It will be remembered that Jacob Jones had entered upon the study of medicine before receiving a midshipman's warant in 1799. Then he was a green youth befriended by his messmate, Stephen Decatur, Jr., with whom he was now to share some of the honors of war as a commander. It may be presumed that he took good care of the following midshipmen, who were present in the action with the *Frolic:* George Van Cleve, A. S. Ten Eyck, Richard Brashears, John Holcomb, William J. McCluney, C. J. Baker, Charles Gaunt.

These midshipmen, of whom some were newly appointed, had the singular experience of participating in the defeat and capture of the enemy's ship, and of falling afterwards into the clutches of a British 74, while Captain Jones was taking his dismasted prize into the nearest port. Thus these young gentlemen were the first prisoners of war of their grade, unless there were some midshipmen on board of the brig *Nautilus* (14) when she was taken (July 15, 1812) by an English squadron, which does not appear in the records. They also took part in the first successful attempt at boarding an enemy's ship, and when the order was

given to board the *Frolic*, one of their number, Midshipman Baker, in his eagerness to be in front, seized the coat-tail of the first lieutenant, Biddle, who was leading the boarding party over the enemy's bowsprit, which caused the lieutenant to fall back on the *Wasp's* deck. In a moment, however, they were both on the deck of the *Frolic*, and soon after the victory both vessels were captured by H. M.'s line of battleship, *Poictiers*, 74. It is in his description of the accurate fire of the *Wasp* which quickly dismasted the *Frolic* in a heavy sea, that Abel Bowman first noted the American method of firing as the ship's side was going down. Of course, the sea poet could not permit such an opportunity for a little glorification and a bon-mot to pass, hence we find in the "Naval Songster" of 1815, the song jocularly entitled "The Wasp's Frolic," written in commemoration of the victory.

October 25, 1812. Capture of H. M.'s frigate *Macedonian*, 38 (Captain John Carden), by the U. S. frigate *United States*, 44 (Captain Stephen Decatur), off the Western Islands.

The following midshipmen were present in this memorable battle: John P. Zantzinger, John Stansbury, Joseph Cassin, Philip Voorhees, Richard Delphy, Dugan Taylor, Richard S. Heath, Edward F. Howell, Archibald Hamilton, John McCan, H. Z. W. Harrington, William Jamieson, Lewis Hinchman, Benjamin S. Williams.

It is a remarkable fact that no casualty occured among these thirteen young gentlemen, notwithstanding their presumed unlucky number, but the midshipmen of the *Macedonian* were not so lucky, since two of their number were wounded. Another English midshipman—a prisoner on the *United States*, read the burial service when any of the English sailors—prisoners also—died of wounds and were committed to the deep.

There is no mention of any special act of gallantry of the Yankee midshipmen, but one of their number, Archibald Hamilton, and probably for meritorious conduct, was selected by Captain Decatur for the enviable honor of carrying the colors of the *Macedonian* to Washington. This son of the Secretary of the Navy of that day, was "a remarkable youth," says Bowen, "of such gentlemanly deportment and amiable manners as to win and retain the esteem of all who knew him." He was afterwards killed, almost in the presence of his old commander, on board the frigate *President*, when she was captured in January, 1815.

It appears that Captain Carden after joining his ship at Lisbon made every effort to have a picked crew. He was a firm believer in the discipline of the cat-o'-nine tails,[66] which was used by his order on the slightest provocation. But it did not increase the order or fighting spirit of his crew, some of whom, "as the slow sailing *United States* was seen bearing down upon the British frigate *Macedonian*, openly expressed the wish that the coming foe were a Frenchman and not a Yankee." This is the testimony of Samuel Leech,[66] a powder boy on the main deck of the *Macedonian*, who writing of the battle in 1843 says that the Yankee fire quickly made a slaughter-house of the *Macedonian*, and that even the schoolmaster[67] of the ship, and the officer's goat were killed. Midshipman Greenway, of the *Macedonian*, was severely wounded. Young Leech, reasonably supposing that he too might be hit, prayed for deliverance as he passed to and fro between the magazines and the guns he served with ammunition, which fact may have shielded him from the cannon-balls that made such havoc on the *Macedonian* on that terrible Sunday. When she was taken to Newport, New London and New York, this youngster turned his captivity to good account "by showing visitors over the prize ship, describing the actions and pointing out the spots where individuals fell," and in order not to offend the susceptibility of the Americans, he covered the English anchor buttons of his jacket with blue cloth. He must have been a favorite with the Yankee tars, as he accompanied them to the dinner and theatrical entertainment given in their honor by the citizens of New York. He afterwards enlisted in the American Naval Service, as did Captain Carden's splendid band of Spaniards and Portuguese, who shipped with Captain Decatur in the frigate *United States*, transferring their allegiance from flag to flag as easily as they changed their uniforms. Surely the gallant Decatur had fairly won this musical prize, which was considered not the

[66] A sailor of the *Macedonian*, in whose possession a midshipman's handkerchief was found, received 300 lashes through the fleet and was imprisoned besides for a year.

[66] "Thirty Years from Home, or a Voice from the Main-deck," by Samuel Leech, 1 Vol., 12m, Boston, 1843.

[67] Dennis Colwell, rated on the ship's book as a landsman, and considered a non-combatant, was the first of his kind to lose his life in a naval action.

least among the trophies of his victories, and was perhaps the first complete military band in the navy.

Another favorite of the tars of the *United States* was a stripling, about nine years of age—the orphan son of a common sailor, who had placed him in charge of a gunner of that ship—who, with the spirit of a man, asked Captain Decatur previous to the action, to have his name put on the muster roll of the crew so that he too might have a share of the prize money which "all hands so confidently anticipated." The request was granted, and after the fight Decatur told him that his share would be about $200.[68] He took the boy under his protection and procured a midshipman's berth for him. Bowen states that his education was carefully attended to, and that he gave promise of making an accomplished officer, but the chronicler omits to mention the name of the youth.

A fair and temperate poetic description of this battle was printed in the British Naval Chronicle of 1812, and two songs published in commemoration of this victory in 1813 are found to be in Luce's collection.

Corbett, in his Weekly Register of 1812, speculating strangely as to whether it was the senior or junior Decatur who captured the *Macedonian*, says, "If it be the son, I am sure it was the first battle he was ever in, for twelve years ago he was a mere lad. The father was a man of great probity, and of excellent sense, and I have no doubt that the son is the same; but I'll engage that both had more experience in raising corn than in naval tactics."[69]

Leech says that when Decatur visited his prize, the *Macedonian*, on the way to New York, "he wore an old straw hat and a plain suit of clothes," showing that his early country training and habits clung to him as a naval officer in the matter of dress at sea and when not before the public. But Corbett evidently had lost sight of his neighbor in Pennsylvania, the Decatur farmer, and had not heard of the heroic deeds of the young Stephen in the Tripolitan War. He certainly would not have recognized the farmer

[68] The able-bodied seamen received, of course, a larger share of prize money.

[69] Stephen Decatur, senior, was dropped from the naval service under the Peace Establishment of 1801, and engaged in commercial pursuits in Philadelphia. Tiring of such occupation he followed the example of other old seamen in purchasing a farm which was situated near Frankford, Pennsylvania, where he established gunpowder works, under the impression, perhaps, that there was much more fighting yet to be done by the young nation before her commercial ambition would be realized.

boy in the celebrated Commodore Decatur, described in "Tom Cringle's Log," as he appeared in the streets of Bermuda, in 1815, after the capture of the frigate *President*, dressed in tight worsted net trousers and Hessian boots, a blue frock-coat with gorgeous epaulets, and a round hat of the latest French pattern—"very much a Frenchman in manner, or I should say in look." How different was the picture of Captain Deadeye—"the last of the British sea monsters"—described in the same book: "He was a staid, stiff-rumped, wall-eyed, old first-lieutenantish looking veteran, with a coat of the Rodney cut, broad skirts, long waist, and stand-up collar, over which dangled either a queue, or a marlin-spike with a tuft of oakum at the end of it—it would have puzzled Old Nick to say which. His lower spars were cased in tight unmentionables of what had once been white kerseymere, and long boots, the coal-scuttle tops of which served as scuppers to carry off the drainage from his coat flaps in bad weather." But this exaggerated type of officer was rarely seen after the great victories of the Nile and Trafalgar, one of the many consequences of which was greater uniformity and less eccentricity in the dress of naval commanders, while abating nothing of the swagger and tone of the lords of the seas. The first notable change in the latter peculiarity took place in the War of 1812-15, with the *United States*, in which the British naval officer met a foeman of his own blood and worthy of his steel.

December 29, 1812. Capture and destruction of the *Java* (Captain Henry Lambert) 38, by the *Constitution*, 44 (Captain William Bainbridge), off the coast of Brazil.

Midshipmen present on the *Constitution* in this engagement were: Ambrose L. Field, Henry Gilliam, Thomas Beatty, Lewis Germain, William L. Gordon, Frederick Baury, Joseph Cross, Alexander Belcher, William Taylor, Alexander Eskridge, James W. Delancy, James Greenleaf, William D. McCarty, L. W. Nixon, John A. Wish, Dulaney Forrest, George Leverett, Henry Ward, John C. Long, John Packet, Richard Winter.

The increased number of midshipmen present in this engagement shows the popularity of the frigate *Constitution*, and the urgent pressure of unemployed midshipman for active service. Twelve of those named were in a certain sense already veterans in naval warfare, having participated in the memorable escape of the *Constitution* from a closely pursuing squadron, and in her

brilliant victory over the *Guerrière*, and we can well imagine how many thrilling stories of these events were told in the midshipmen's mess by the veterans to the youngsters just joined, and how eagerly the latter welcomed the sight of the *Java* and the certainty of a fight. This feeling was doubtless shared by their gallant but hitherto unfortunate commander—Bainbridge—who had lost his fine frigate, the *Philadelphia*, by shipwreck in the Tripolitan War, and had been debarred by long imprisonment from winning laurels in the Tripolitan War. Now, by the generosity of Hull in resigning the command of the *Constitution*, Bainbridge at last had an opportunity of proving his great professional skill by dismasting and blowing up a well commanded frigate of the enemy after nearly two hours of fighting and maneuvering. Again the lucky midshipmen of the lucky *Constitution* escaped without a casualty, but two of the midshipmen (twins) of the *Java* were killed, and four wounded severely. Fifteen midshipmen of the *Java* were among the prisoners taken and paroled.

February 24, 1813. Capture and sinking of H. M. sloop *Peacock*, 18 (Captain Wiliam Peake), by the U. S. sloop *Hornet*, 18 (Captain James Lawrence), off Demerara.

There were present on the *Peacock*[m] Benjamin Cooper, French Forrest, George Getz, Ira Titus, William Boerum, William E. McKenney, Thomas A. Tippet, Joseph Smoot.

These were all newly-appointed midshipmen, who, under the command of the gallant Lawrence, witnessed one of the most brilliant victories of the war, considered by many to be "the very masterpiece of American gunnery." Within fifteen minutes the *Peacock* was cut to pieces, and sunk so rapidly that Midshipman Cooper, with Lieutenant Conner, of the Hornet, while employed in removing the prisoners from the *Peacock*, barely saved their lives by jumping with their men into a boat that was lying near as the latter went down.

A Halifax newspaper commenting upon this disaster says, "If a vessel had been moored for the sole purpose of experiment it is not probable she could have been sunk in so short a time."

This engagement was celebrated in the well-known song entitled "The Hornet, or Victory No. 5," found in Luce's collection.

[m] A midshipman of the *Peacock* was wounded.

June 1, 1813. Capture of the U. S. frigate *Chesapeake*, 38 (Captain James Lawrence), by H. R. M. frigate *Shannon*, 38 (Captain Philip B. V. Broke), off Boston Harbor.

There is no published list of the midshipmen of the *Chesapeake*, but we gather from official dispatches of the action and other sources that the following midshipmen were present on this occasion: Pollard Hopewell, Francis Nichols, James Forrest, James A. Curtis, Wm. Cox, Edward L. Ballard, John Evans, Walter Abbott, William Randolph, William A. Weaver, William Berry, D. Higginbotham, Edmund M. Russell, Horatio Beatty, William Steele, Courtland Livingston. Of these Hopewell, Evans, Livingston, and Ballard were killed, and Nichols, Abbott, Weaver, Russell, Berry, and Cox were wounded. The latter were returned to Boston with other prisoners in the cartel *Frederick Augustus*.

We know that Midshipman Randolph was stationed in the fore-top of the *Chesapeake*, Midshipman Fleischman in the main-top and Midshipman Berry in the mizzen-top, from which elevated positions they could witness the bloody incidents of the battle raging beneath and around them. An English naval historian informs us that there was fighting even in the tops, a party of five men led by Midshipman William Smith of the *Shannon* having gallantly stormed the main-top of the *Chesapeake*, while his messmate, Midshipman Cosnahan "kept up a brisk fire from the starboard yard of the *Shannon* upon the Americans as fast as his men in the top could load the muskets and hand them to him." The same writer also states that a young midshipman (doubtless Mr. Randolph mentioned above) who slid down a rope from the fore-top of the *Chesapeake*, was saved by Captain Broke of the *Shannon* from the fury of his men, an act greatly redounding to his credit."[1]

In the testimony, however, of Midshipman Berry (stationed in the mizzen-top of the *Chesapeake*) given in a letter to Lewis Condit, of Washington, we find this statement: "After the enemy had complete possession of the ship, Midshipmen Randolph and Fleischman were ordered from the fore and main-top. In coming down the shrouds Lieutenant Faulkner (the British officer) said

[1] William James, in his Naval History of England, recites these facts and states that three midshipmen of the *Chesapeake* were killed and five wounded "according to the American accounts," but we find a total of six midshipmen of the *Chesapeake* wounded and four killed, as given above.

to his men 'Kill those damned rascals.' Then, and immediately several muskets were discharged at them, but without effect. My station was in the mizzen-top, where I had an opportunity of seeing their actions. . . . . Lieutenant Faulkner looked up in the mizzen-top, and pointing to me, said to his men, 'Go up three of you and throw that damned Yankee overboard.' They immediately rushed up, and seized me by the collar, saying, 'Now you shall swim for it,' attempting to throw me overboard; but I got within the rigging, when one of them kicked me in the breast, which was the cause of my falling. Being stunned by the fall, I lay some time senseless, and when I came to, I was cut over the head with a cutlass."

Our code of naval signals on the *Chesapeake* fell into the possession of the enemy, which necessitated the making of a new code, arranged so as to insure it against discovery except by treachery.

It appears that several midshipmen (names not given) went below to pass the word for hesitating boarders to come on deck after Captain Lawrence gave the order, and were killed, probably by some of the *Shannon's* men who fired muskets down the hatchway. These probably were the three named in the above list. Midshipmen Cox and Ballard acting as third and fourth lieutenants, and towards the close of the action the upper deck of the *Chesapeake* was left without an officer above the rank of a midshipman, all those of superior rank having been killed or wounded. Unfortunately we cannot give the names of the midshipmen who confronted the *Shannon's* boarders on the quarter-deck of the *Chesapeake*, but we are justified in stating that never in naval warfare have young officers of their rank and years been placed in a position of such terrible responsibility, and never perhaps in any single or general engagement have there been so many casualties among the midshipmen of any one ship as are above recorded.

There were two regrettable incidents of the day which tarnished the record of two midshipmen of the *Chesapeake*. Midshipman James W. Forrest was reported for drunkenness during the engagement (perhaps a continuation of the debauch in which the whole ship's company had been involved before the action) and for having left his quarters, and was cashiered, but as he had borne himself well in the previous action between the *Constitution* and *Java*, he was reinstated.

The other regrettable case was that of Henry P. Fleischman, who

committed the unmanly act of giving an assumed name when the muster roll of prisoners was made out after the battle, in order to effect his parole. For this unmilitary offence he was court-martialed, but escaped a severe punishment by his good conduct in the action. "In consideration of his youth, inexperience, and good conduct in the action" he was simply reprimanded publicly.

It was, moreover, a new experience in this war for "American midshipman to be made prisoners in consequence of their surrender of their ship—a disaster rendered more poignant by the loss of their brave commander's life.

Captain Philip B. V. Broke was made a Baronet and Knight Commander of the Bath for his capture of the *Chesapeake*—the only well-earned reward won by a British commander during the war. The result was, of course, attributed to good gunnery, but it seemed strange to American readers that the military critics of that war-like period could single out among the officers who were brought up under Nelson and fought at the Nile and Trafalgar, only two—Captain Broke of the *Shannon* and Captain John Pechell of the *San Domingo*—who paid much attention at this time to gunnery, and who consequently had the most effective ships in the British Navy. Yet if the action with the *Chesapeake* had taken place on the second instead of the first of June, or if Lawrence [12] and his officers and crew had not been so highly elated at that particular hour, there are reasons for believing that the *Shannon* would have been beaten. He had proved his mettle and great skill in the destruction of the *Peacock*. But it was destined to be otherwise in his last fight, despite such anticipation of victory as is humorously described in that capital bit of literary revenge aimed at the officers of the *Chesapeake* by a writer in the British Naval Chronicle (of 1813) after the news of the capture reached England.

Quite sure of the game,
As from harbor they came,
A dinner and wine they bespoke;
But for meat they got balls
From our staunch wooden walls,
So the dinner engagement was Broke.

[12] Lawrence received his death wound from one of the *Shannon's* topmen, and it was probably the only instance in this war in which the British profited by the lesson taught them in the death of Nelson at Trafalgar.

Commodore John Rodgers, in his report to the Secretary of the Navy of his cruise in the North Sea, alludes to a newspaper statement of the fight between the *Chesapeake* and the *Shannon* and Captain Broke's expression of regret that he had not met the *President* and *Congress* with the *Shannon* and *Tenedos,* and expresses the hope that Captain Broke "has not been so severely wounded as to make a sufficient reason to prevent his reassuming the command of the *Shannon* at a future day."[73]

The gallant Broke merited all the honors bestowed upon him for having scored the first and only important victory over an American frigate (of equal force). In order to perpetuate its memory the British Admiralty has maintained to this day in active service a vessel of war named the *Chesapeake.*[74]

We find, too, in the "Young Idea"—a nautical journal edited on board of that ship at sea by her midshipmen, in 1857-8-9, a song entitled "The Chesapeake's Barge," written by one of their number in praise of the English frigate's boat. It was set to the music of "Yankee Doodle," the opening verse being as follows:

> Of the '*Chesapeake's*' of old
> We often have been told
> How the '*Shannons*' licked their Yankee lads so handy, oh,
> But the '*Chesapeake's*' anew
> Are as brave a British crew
> As ever fought the Yankee Doodle, dandy, oh.

A singular memorial of this naval duel is a recent donation of £500 from Sir George Broke Middleton (a relative of the *Shannon's* captain) to the Queen Elizabeth Grammar School, at Ipswich, England, on condition that it be used in this sense, in the erection of a swimming bath for the scholars. It may be that Sir George regards this swimming bath as a means of infusing into these youths a desire to follow the sea and emulate the ex-

[73] Captain Blythe of the *Boxer* was a pallbearer at the funeral of Lawrence at Halifax in June, 1813, little dreaming that he was to be the next victim of the war in the following September, to fall in battle as Lawrence had fallen, and like him to be borne to a foreign grave "mourned and admired by generous conquerors."

[74] If the original *Chesapeake's* guns are still in existence, in some British gun-park, it will be found that they had significant names engraved on small squares of copperplate, such as Brother Jonathan, True Blue, Yankee Protection, Raging Eagle, Mad Anthony, Bunker's Hill, America, Washington, etc.

ploit of Captain Broke. The action has also recently been revived by that popular writer of sea-tales, William Clark Russell, who in his "In the Middle Watch" gives a letter from "an old sea-dog of ninety-one who was on board the British frigate on that day." There is nothing new in his testimony, but we find in a statement of the late Mr. Ogle Taylor, of Washington, who dined with Lawrence and other officers the day before the action, the most convincing proofs of the unreadiness of the *Chesapeake* to meet an enemy when the *Shannon* was sighted off Cohasset Rocks. But Lawrence was not the man to seek chances in his favor, and contrary to the urgent advice of Hull and other friends he sailed out of Boston harbor to his death.

During some reciprocal banter at the dinner party just mentioned, between Hull, who had recently married a beautiful woman, and Lawrence, the latter said, "You are an old fellow, Hull; some of us will have a chance for your widow," to which Hull replied, "I have a better chance than you, as the *Shannon* is on the coast and may knock your head off."

In some of the minor affairs of this year (1813), we find June 22, 1813, Midshipman Bladen Dulaney mentioned with Lieutenants Tatnall and Geisenger in the defence of Craney Island, in Hampton Roads, against a large landing force of the British. They captured Admiral Warren's splendid barge,—50 feet long, with 24 oarsmen—called the *Centipede*, and a brass 3-pounder at her bow called a "Grasshopper," commanded by Captain Hanchett, a natural son of George the Third—in which barge Tatnall afterwards passed many a cold night's guard duty.

June 26, 1813. In the attack led by Commodore Joshua Barney upon the enemy's frigates anchored near the Patuxent river, Midshipman Aisquith, who had just joined, was killed.

July 13, 1813. Midshipman H. M. McClintock, of the schooner *Asp*, armed with three small guns, and commanded by Midshipman Sigourney, reported to Secretary Jones a sharp engagement with a flotilla of British armed barges in Yeocomico creek, Virginia, during which the schooner was set on fire by the enemy and Mr. Sigourney killed, his body being consumed in the fire. Out of the crew of twenty-one men, ten were killed, wounded and missing, but Midshipman McClintock afterwards recovered the schooner.

July 28, 1813. Midshipman Ten Eyke, in a small boat, drifted

away by wind and tide from other boats of the frigates *Macedonian* and *United States* in Long Island Sound, landed on Gardner's Island, so well known to the naval cadets of our day cruising in practice ships. In the morning a boat from the English frigate *Ramillies* brought to the island several officers who visited a farmhouse within the ken of the watchful Ten Eyke, who, seizing a favorable moment, made prisoners of one midshipman, one master's mate and five seaman who were left in the frigate's boat, and then, with two of his men, proceeded to the house, where he captured two lieutenants, making in all nine prisoners, of whom four were officers. A very good morning's work for a midshipman. Of course, the fact was quickly discovered on board the *Ramillies*, which led Ten Eyke to parole his prisoners and make good his escape to Long Island.

July, 1813. Midshipman Mervine Mix constructed a torpedo, and with the assistance of Midshipman McGowan and a merchant captain, made several attempts to blow up H. M. S. Plantagenet, 74, anchored for some months, as a guard ship perhaps, abreast of Cape Henry Lighthouse. Finally Mix succeeded in placing his torpedo in a favorable position, and although it exploded too soon, it very nearly affected its purpose as it was swept along with the tide. It threw up a column of water from forty to fifty feet in height, which deluged the *Plantagenet* and her fore channel, and a boat alongside with several men in her were hoisted in the air by the explosion.

August 13, says Bowen, 14th say others—Capture of the U. S. S. *Argus*, 18 (Captain Allen), by H. B. M. *Pelican*, 18 (Captain Maples), in St. George's Channel.

This was one of the two actions (the other being that between the *Chesapeake* and *Shannon*) in which the British critics were kind enough to acknowledge that "The Yankees nobly sought the combat"—a strange admission in view of the previous deliberate seeking and capture of the enemy by Hull and Bainbridge in the *Constitution*, Decatur in the *United States*, and Jones in the *Wasp*. The *Argus* was captured, but both the captains were mortally wounded, and two meritorious midshipmen of the *Argus*—Delphy and Edwards, were killed. Midshipman Delphy lost both of his legs in the action, which misfortune the surgery of that day was unable to repair. There is no list of the full complement of midshipmen on board the *Argus*, nor are there any particulars of their

service, but we may conjecture that Delphy and Edwards, on learning the result of the action, were glad enough to share the fate of their gallant captain. The surviving midshipmen of the *Argus* were of course taken prisoners with the rest of the ship's company.

September 5, 1813. Capture of H. M. brig *Boxer*, 14 (Lieutenant Samuel Blythe in command), by the U. S. brig *Enterprise*, 14 (Lieutenant S. M. Burrows in command), off Portland, Maine.

In this engagement, also, the British commander was killed, and the American commander was mortally wounded, the latter being succeeded by Lieutenant Edward McCall, who finished the battle with great skill and courage. Of four midshipmen present, viz., Kervin Waters, William F. Shields, Vincent L. Sassier, Richard O'Neal—Midshipman Waters was killed and buried by the side of his commander and their late enemy, Captain Blythe, of the *Boxer*, in Portland.

Lossing says, "The tomb of Midshipman Waters is a marble slab resting on four sandstone pillars. On the slab is the following inscription: "Beneath this marble, by the side of his gallant commander, rest the remains of Lieutenant Kerwin Waters, a native of Georgetown, District of Columbia, who received a mortal wound, September 5, 1813, while a midshipman on board the U. S. brig *Enterprise*, in an action with his Britannic Majesty's brig *Boxer*, which terminated in the capture of the latter. He languished in severe pain, which he endured with fortitude, until September 25, 1813, when he died with Christian calmness and resignation, aged eighteen. The young men of Portland erect this stone as a testimony of their respect for his valor and virtues."

The suggestive name of the British brig defeated in this action was used by the poetaster in the song entitled "The Enterprise and Boxer." (This song is found in Luce's collection, page 128), to emphasize the victory of the "brave tars of Columbia."

September 10, 1813. Battle of Lake Erie—defeat and capture of the British squadron of six vessels carrying upwards of sixty guns, under Commodore Barclay (one of Nelson's officers at Trafalgar) by the American squadron of ten vessels carrying fifty-five guns, under Commodore Oliver Hazard Perry, on Lake Erie.

In this first hostile meeting of squadrons of vessels during the war, the midshipmen, as well as their superior officers, obtained a

much broader conception of the art of naval warfare and of naval tactics than was possible in the actions between single ships. Fortunately Commodore Perry,—a midshipman of 1799, and a diligent student of his profession in war and in peace—was now only twenty-seven years of age, in the very prime of physical and intellectual manhood, and with a lion heart which no odds or adverse circumstances could quail. Fortunately, too, the commanding officers serving under him were all young men. Lieutenant Champlin of the *Scorpion*, who fired the first shot of the battle, being twenty-four, Lieutenant Turner of the *Caledonia*, only twenty-one, Lieutenant Almy [m] of the *Somers* not much older, and, youngest of all, Midshipman Lenox, who commanded one of the small vessels of the squadron (name not given.)

From the official reports of Commodore Perry and his captains, we learn that there were twenty-one midshipmen distibuted throughout the squadron on that glorious day for the American Navy, as follows: Thomas Claxton, Augustus Swartwout, Henry Laub, —— Lunt, P. K. Durham, James A. Perry, Dulaney Forrest (acting as lieutenant), —— Webster (acting as sailing master), J. C. Cummings, J. B. Montgomery, Charles Smith, S. W. Adams, Robert S. Tatem, Simeon Warm, John Clarke, J. W. Wendell, Alexander C. Stout, Hugh N. Page, Daniel C. Nichols, James Bliss, —— Lenox, G. Senat.

All of these, with the exception of Dulaney Forrest, were on duty afloat for the first time, but before the close of the day they had witnessed all the horrors of a sea fight and experienced all the joys of victory. They had also, as usual, a good share of the casualties of the day. Midshipman Claxton and Swartwout of the flagship *Lawrence*, and Midshipmen Cummings and Montgomery of the *Niagara* (to which Commodore Perry's flag was transferred during the engagement), being severely wounded, and Midshipmen Lunt, Clark of the *Scorpion*, and Laub of the *Lawrence* being among the killed. The latter had his arm badly shattered, and after the surgeon had dressed his wound in the steerage, "a round shot came crashing through the side of the vessel, struck the young man in the side, dashed him across the deck and killed him instantly."

[m] It is worthy of note that Commodore Perry, Champlin, Almy, Turner, Taylor, Bromwell, Breese, Dunham, and Alexander Perry, commanding 47 of the 55 guns of the squadron, were all Rhode Islanders, making Lake Erie, as Lossing says, almost a Rhode Island battle.

Midshipman Montgomery, of the *Niagara*, having been wounded in the arm so that it became necessary to amputate it, coolly directed the surgeon "to look out for the ring on the finger of the limb, which his sister Margaret had given him before going to sea."

Commodore Perry, in his report of the battle deplores the loss of Midshipmen Laub and Clarke,[76] who were "valuable and promising officers," and states that Midshipman Webster—doing duty as sailing master of the Niagara—"behaved in a very handsome manner." He also refers with great satisfaction to his signal officer, Midshipman Dulaney Forrest, acting on that occasion as a lieutenant. His previous record entitled him to this responsible position of signal officer, in which he was doubtless a target for the enemy's fire. (And if it was he who accompanied the Commodore in the perilous transit, in an open boat—as is represented in Powell's picture of the battle—from the *Lawrence* to the *Niagara* during the engagement, he had a full share of the honors of the day.) All the world knows that Perry's famous blue battle-flag—his signal to the squadron on going into action——had emblazoned upon it in white letters of muslin the dying words of the gallant but unfortunate Lawrence, "Don't give up the ship," which became a watchword and a heritage for the United States Navy, to be prized and preserved forever."[77] It is not generally known, however, that this flag, prepared at the commodore's request, before the battle, by Purser Hambleton of the *Lawrence*, is now in the possession of the Hungerford Collegiate Institute at Adams, in the State of New York.

1812-14. Operations of Commodore Isaac Chauncey's squadron on the Upper Lakes—the capture of York.

It is impossible to give a full list of the midshipmen who served in the several vessels of this squadron, but we find the following names mentioned in the reports of its operations, which, like those of Perry on Lake Erie, were of great importance in determining the issue of the war.

[76] Midshipmen Lunt—says Lossing—and Clarke were buried with Lieutenant Brooks and other officers of the British ships on the margin of South Island in Put-in-Bay Harbor.

[77] It was Dulaney Forrest, a midshipman in the fight with the *Java* and now a lieutenant and signal officer under Perry, who had the honor of carrying the dispatches, the captured flags, and Perry's battle flag to Washington.

In October, 1812, Midshipman Cummings was wounded in the brilliant capture of the brig *Detroit* by Lieutenant Elliott.

November 28, 1812. In a boat expedition against the enemy, on the Canada coast, several midshipmen distinguished themselves, viz., Wragg, Holdup, and Dudley. Wragg was wounded in the abdomen, by a bayonet; Mr. Graham lost a leg; Mr. Holdup was shot through the head; Mr. Brailesford was shot through the leg, and Mr. Mervine received a musket ball in the side. Mr. Dudley, although much exposed, escaped without a scratch. (Cooper.) Messrs. Dudley, Holdup, and Wragg remained in Canada until the close of the fighting. These three young gentlemen, neither of whom was yet twenty, met at the water side about daybreak and got into a leaky canoe which Mr. Dudley brought out of a creek. The latter made two paddles of rails by means of a battle-axe, and taking in three wounded seamen and two that were unhurt, they put off from the Canadian shore. Notwithstanding they bailed with their hats, the canoe sunk under them close to Square Island. Here they dragged their wounded men ashore, got the canoe emptied, hauled her round to the American side and made a fresh effort to cross, in which they succeeded, though the canoe was nearly filled again before they reached the shore. One of the wounded men died just as the party reached the shore. (Cooper.)

Messrs. Holdup, Dudley, Packet, Yarnall, Wragg, Adams, Pearce, Edwards, Jones, Conklin, and Smith (midshipmen), came out of these engagements with the rank of acting lieutenants, although young in years and experience.

April 25, 1813. In Commodore Chauncey's report of the naval operation before York, Upper Canada (captured by joint military and naval expedition), he expresses great regret at the loss of Midshipmen Thompson and John Hatfield, two promising young officers of the flag-ship *Madison,* killed while employed in their boats.

June 19, 1814. Midshipman Elliott commanded the gunboat *Lady of the Lake,* 6 guns, belonging to Chauncey's squadron on Lake Ontario.

Commodore Chauncey reports the brilliant services of young Lieutenant Gregory (who had distinguished himself in 1811 in capturing piratical vessels) of the flag-ship *Superior,* in his capture and destruction of a brigade of boats of the enemy at Kingston, speaks of him as "not surpassed by any of his grade in zeal, intelligence and integrity." He also commends Midshipman Dixon,

commanding a gig under Gregory, who together with sailing master Vaughan, also commanding a gig, "Are entitled to my acknowledgments for their zeal and activity on all occasions to render service to their country, more particularly in the last expedition, when from their knowledge of the river, they rendered the most important services by pointing out the proper channels to elude the pursuit of the enemy."

June 30, 1814. In his report of this gunboat expedition, he mentions his indebtedness to the unremitting exertions of Midshipmen Mackay, Hart, and Caton.

October, 1814. Midshipman McGowan, accompanied by William Johnston, the "Hero of the Thousand Islands," went with a torpedo to Kingston harbor to blow up Sir James Yeo's big flagship (pierced for 112 guns), but unfortunately she had sailed from that port.

This squadron, noted for its strict discipline, as well as its well-drilled crews in gunnery and seamanship, was a capital school for the midshipmen, several of whom acted as watch officers, the most meritorious of them being honored with lieutenant's commissions during their first year in the service.

March 9, 1814. Captain G. Gordon, of the *Constellation*, off Craney Island, reported to the Secretary of the Navy the death of Midshipman Hall as follows: "He was quite young, and the smallest midshipman on board, but a youth of great promise, who had so much endeared himself to the officers and crew that his loss has spread a momentary gloom over the whole ship. He fell from the mizzen topmast head to the quarter-deck yesterday evening, while we were in the act of sending down the top-gallant yards, and he expired instantly." On the first of July of the same year, Midshipmen Brailesford and Rogerson of the U. S. schooner *Alligator*, lost their lives in a tornado that struck and capsized the vessel while she was at anchor in the harbor of Port Royal, South Carolina. These casualties reveal some of the dangers to which officers are exposed when snugly anchored in a home port. What may happen to vessels anchored in a foreign port, when attacked by an enemy, appears in the next recital.

March 27, 1813. Capture of U. S. S. *Essex*, 32 (Captain David Porter), by H. M. frigate *Phœbe*, 36 (Captain Hillyar), and sloop-of-war *Cherub*, 20 (Captain Tucker), in Valparaiso Bay.

Of the midshipmen who sailed with Captain Porter on this

memorable cruise, we know the names only of those mentioned in the official dispatches, who probably comprised the whole of their grade who sailed from the United States with Captain Porter in the *Essex*. The latter in his report of the action states with evident pleasure that Midshipmen George W. Isaacs, David G. Farragut and —— Ogden, as well as acting Midshipmen James Terry, James R. Lyman and Samuel Duzenbury, "exerted themselves in the performance of their respective duties and gave an earnest of their valor to the service; the three first are too young to recommend for promotion, the latter I beg leave to recommend for confirmation." These three acting appointments were doubtless made during or previous to the fight for meritorious services, and were of course confirmed at Captain Porter's request.

Midshipmen Farragut and Isaacs were both slightly wounded in the action. It appears that Midshipmen Lyman and Adams were made prisoners, as Captain Porter towards the close of his report of the engagement says, "I exchanged Lieutenant McKnight, Mr. Adams, and Mr. Lyman (both midshipmen) and eleven seamen for part of the crew of the ship *Sir Andrew Hammond*, and sailed from Valparaiso Bay on April 27, 1813, where the enemy were still patching up their ships.

Another midshipman, whose name is not mentioned, had been previously put in command of a merchant prize with 86 British seamen prisoners on board, whom he delivered in accordance with his orders to Admiral Duckworth of the British Navy at St. Johns, in exchange for the same number of American prisoners. The successful performance of this hazardous duty by a midshipman without any superior officer to aid him, shows the remarkable merit of the youth. It is also reported that "of a party left in Madison Island (one of the Marquesas group in the Pacific) under Lieutenant John M. Gamble, in charge of some captured vessels and public property in December, 1813, Midshipmen William Felters, John Thomas, Thomas Gibbs, and William Brudinell were massacred by the savages of that island on May 7, 1814, on board of the ship *Greenwich*, in which they were quartered." Midshipman Clapp, however, of the same ship, escaped with Lieutenant Gamble and a few seamen, and arrived, after a series of adventures and misfortunes at Rio Janeiro, whence they were unable to depart until after the declaration of peace.

In these several reports, therefore, we find the names of eleven midshipmen and acting midshipmen of the *Essex*, one of whom may have been the unnamed commander of the merchant prize above mentioned. That they distinguished themselves in the terrible fight of March 27, is evident from the special commendation of the three youngest, and the giving of the acting midshipman's appointments to three other youths by Captain Porter, whose judgments of the merits of fighting men could not be gainsaid, and who in consequence of his own indomitable spirit was honored with the hatred and abuse of his enemy. The surrender of the *Essex* to such superior force was the first serious disaster to our flag, but it was as brilliant and bloody a defense of a ship of war under the circumstances as is recorded in the annals of the sea. It was a lesson, too, for the midshipmen, not only in the ways and means of defending a ship in a great extremity, but also in the maintaining the dignity and spirit of a naval officer in the hour of adversity.

April 29, 1814. Capture of H. M. brig *Epervier*, 18 guns (Captain Wales), by the U. S. brig *Peacock*, 18 (Captain L. Warrington), off the Florida coast.

The following midshipmen were on board the *Peacock* in this fight: Hill Carter, R. N. Buck, John M. Dale, William T. Rodgers, Israel Israel, Thomas Greeves, Nehemiah Tilton, William H. Jenkins.

These young gentlemen had the singular good fortune of taking part in the almost total destruction of the *Epervier*, while the *Peacock* had not a man killed, nor a round shot of the enemy in her hull.[78]

"The fire from Lieutenant Henley's and Voorhees' divisions," said Captain Warrington in his report to Secretary Jones, "was terrible and directed with the greatest coolness and precision." And of the bearing of the steerage officers, he added:

"My clerk, Mr. John S. Townsend, is anxious to obtain through my means, a midshipman's warrant, and has taken pains to qualify himself for it by volunteering, and constantly performing a midshipman's duty. Indeed I have but little use for a clerk, and he is as great a proficient as any of the young midshipmen, all of whom have behaved in a manner that was pleasing to me and

[78] As the *Epervier* had $120,000 in specie on board, the midshipmen must have received a good lot of prize money.

must be gratifying to you, as it gives an earnest of what they will make in time—three only have been to sea before and one only in a man-of-war, yet they were as much at home, and as much disposed to exert themselves as any officers in the ship." Surely this is strong language coming from the chief in command who doubtless had his eye upon every one of his subordinates. Moreover, First-Lieutenant Nicholson, in his report to Captain Warrington singles out as worthy of special commendation Midshipmen Greeves and Rodgers of the *Peacock*, who were with him in the prize.

It is interesting to note also Captain Warrington's splendid tribute to his most efficient First Lieutenant Nicholson, who had distinguished himself in a successful previous engagement with the enemy. "I have confided greatly in him, and have never found my confidence misplaced. For judgment, coolness and decision in time of difficulty, few can surpass him. His greatest pride is to earn a captain's commission by fighting for instead of heiring it." Nor did Captain Warrington forget the sailing master of the *Peacock*, "who handled the ship as if he had been working her into a roadstead." With such a body of officers, the result was a foregone conclusion, but the nautical poets did not celebrate the victory in song, which may have been owing to the difficulty of finding a rhyme for the name of the enemy's ship.

June 25, 1814. Commodore Joshua Barney, in his report of an attack of a flotilla of armed boats upon two frigates of the enemy at the mouth of a creek emptying into the Chesapeake Bay, mentions the loss of "Acting Midshipman Asquith killed and ten others killed and wounded," and adds that "Midshipman Blake was a volunteer in my barge," and was sent to Washington with the dispatches of the encounter.

June 28, 1814. Destruction of H. M. sloop-of-war *Reindeer* (Captain William Manners), by the U. S. sloop-of-war *Wasp* (Captain J. Blakeley), in the chops of the British Channel.

The midshipmen of the *Wasp* were as follows: David Geisinger, Henry S. Langdon, W. B. Randolph, H. S. Lovell, Frank Toscan, Ashton Hall, William House, Thomas Bonneville.

In his brief action, called "a rencontre" by Captain Blakeley, in the enemy's best guarded waters, and lasting only 19 minutes, the *Reindeer* was cut to pieces in a line with her ports, and was set on fire, and finally blown up by the hot shot of the *Wasp*.

The large number of eight midshipmen on board of the *Peacock*, *Wasp*, &c., is evidence of the eagerness of the corps to serve in these small vessels which seemed to find the enemy more frequently than the frigates. Two of the eight serving in the *Wasp* on this occasion, Midshipmen Langdon and Toscan, lost their lives, and are thus feelingly alluded to by Captain Blakeley in his report to Secretary Jones:

"It is with sincere sorrow that I have to announce to you the decease of Midshipmen S. Langdon and Frank Toscan. They were wounded in the rencontre with the *Reindeer*, and all our efforts to save them proved unavailing. It was their first essay, and although wounded they remained at their posts until the contest terminated. The constancy and courage with which they bore their sufferings leads to the melancholy, though proud reflection of what they might have been, had Providence ordained otherwise. Every respect due to worth was shown to their memory."

It must have been pre-eminent worth that drew from Captain Blakeley so touching a lament, and perhaps he had in his mind the fact, while penning those lines, that captains, commodores and admirals had been extolled in naval history for just such heroic spirit and endurance as was displayed by Midshipmen Langdon and Toscan. As their bodies were probably committed to the deep, their only enduring monument is, and will continue to be, in the memory of the corps, in whose roll of merit they have so conspicuous a place.

July, 1814. Midshipman Dixon, serving under Lieutenant Gregory, commanding a boat expedition for the destruction of a 14 gun vessel of the enemy building at Presque Isle, is highly commended in the report of his superior officer.

Night of September 1, 1814. Capture and sinking of H. M. sloop of war *Avon*, 18 (Captain Arbuthnot), by the U. S. sloop-of-war *Wasp*, 18 (Captain Blakeley).

In the absence of a published list of the midshipmen present in this engagement, we may presume that Midshipman Geisinger, Randolph, Lovell, Hall, House and Bonneville, who had participated in the previous victory of the *Wasp* over the *Reindeer*, again had the honor of serving under Captain Blakeley in her night action with the *Avon*. In the former case, the *Reindeer* was blown up in full sight of her antagonist; in the latter case the

shattered *Avon* could not be saved from sinking even with the aid of the vessels that answered her signals of distress. Most fortunate were the midshipmen who sailed in the fortunate *Wasp*, described by one of her officers as "One of the finest sea boats in the world, whose officers and crew fight with more cheerfulness than they do any other duty." Even the anonymous British critic "Albion" could not refrain from extolling "the daring enterprise of the Americans in cruising on the well-guarded home station of the English Navy." It was doubtless singular good fortune that brought the *Wasp* into conflict with three different vessels of the enemy, but it was superior gunnery and seamanship that enabled her to destroy them so effectually. Of all our cruisers during this war, she was the most sought after and the least harmed by the enemy.

September 11, 1814. Defeat of the British squadron of 17 vessels and 95 guns, under Captain George Downie, on Lake Champlain by the American squadron of 14 vessels and 86 guns, under Captain Thomas McDonough.

From the reports of Commodore McDonough and his young captains we learn that the following midshipmen were present in the different vessels of his squadron on this occasion: Charles T. Platt, Thomas A. Conover, Daniel Hazard, Hiram Paulding, Frank Ellery, Joel Abbott, Joseph S. Cannon, William Boden, Lawrence Montgomery, Samuel Thwing, Henry Tardy, ——— Chamberlain, Samuel L. Breeze, Walter N. Monteath, James M. Freeman, John H. Graham, William Machesney, Charles L. Williamson, James M. Baldwin (acting midshipman).

It was just a year and a day after Perry's victory on Lake Erie that Thomas McDonough, a midshipman of 1800, and now a commodore in his twenty-eighth year, led his squadron to a similar triumph on Lake Champlain. Perry was one year younger than McDonough, but his warrant as a midshipman antedated McDonough's [*] one year. Both distinguished themselves in the Tripolitan War, and so close a race for the highest rank in the service, with triumphs so similar as commodores, is almost unparalleled in naval history. Perry, Chauncey and McDonough rendered incalculable service to the midshipmen who participated in their numerous exploits on the lakes, but it was asserted by

[*] McDonough was one of the gallant band of midshipmen who were with Decatur in 1804, when the frigate *Philadelphia* was destroyed by them in the harbor of Tripoli.

contemporary writers that Commodore McDonough's squadron was particularly noted for its strict discipline and well drilled crews in gunnery. Commodore McDonough himself states that the artillery firing in this battle was so accurate that "there was not a mast in either squadron that could stand to make a sail on." And Midshipman Lee, of the British flag-ship *Confidence*, in a letter to his brother, dated December 14, 1814, wrote: "I don't think there are more than five of our men, out of three hundred, but what are killed or wounded. Never was a shower of hail so thick as the shot whistling about our ears. Were you to see my jacket, waistcoat and trousers, you would be astonished to know how I escaped as I did, for they are literally torn all to rags with shot and splinters; the upper part of my hat was also shot away."[80]

The midshipmen specially named in the dispatches are as follows: Midshipman Hiram Paulding, of the *Ticonderoga*, then in his sixteenth year,[81] had command of a division of eight guns, in consequence of the want of officers of higher rank. "When the British galleys approached, it was discovered that the matches for firing the cannon were useless. Young Paulding saw no resource but the flash of a pistol, and with his own hand, he thus fired the guns of his division during a combat of more than two hours; and in the interval of cannon firing, when the enemy were within pistol shot, he discharged his weapon against them." This fact, not mentioned in the dispatches, was obtained by Lossing from the lips of the late Commodore Tatnall.

Midshipman Charles Platt, aid to Commodore McDonough on board the *Saratoga*, had the great distinction of passing three times through the line of the contending fleets, in an open boat, carrying orders ("rivalling the achievement of Commodore Perry at Lake Erie.") The fire of the enemy was directed upon his boat whenever the lifting clouds of smoke exposed it to view. He succeeded, however, in carrying his orders, although his hat, his coat and finally his boat were penetrated, but he regained his ship, the *Saratoga*, with great difficulty. Congress voted to him a sword, in testimony of his gallantry on this occasion.

Lossing states that Acting Midshipman James M. Baldwin, who probably received his acting appointment for some meritorious

[80] This letter is published in O'Beirne's Naval Biography.

[81] Midshipman Paulding was only thirteen years of age when he entered the service in 1812.

act, was wounded in the battle, but Bowen says that he was killed, having probably died of his wound, and he adds that almost every officer of the *Saratoga* was killed or wounded. Yet it appears that the midshipmen of the squadron lost only one of their number by the fire of the enemy, viz.: the above mentioned Mr. Baldwin, who was buried with several of his brother officers in the Plattsburg Cemetery, where were deposited also the remains of the British Commodore, Downie, and some of his officers. Four of their midshipmen were sent with other officers prisoners to Greenbush.

In the dispatches of Commodore McDonough, Midshipman Montgomery is mentioned as very efficient in carrying orders throughout the flag-ship *Saratoga,* and "Midshipmen Monteath, Graham, Williamson, Platt, Thwing and Acting Midshipman Baldwin, are declared to have behaved well and given evidence of their making valuable officers." Captain Henley, of the *Eagle,* extolled the valuable services of Midshipmen Chamberlain, Machesney and Tardy, and recommended them to official notice. In fact almost every midshipman in the squadron made a good record in this battle.

September 13, 1814. Two days afterwards, every midshipman in the navy, and every young man in the land had occasion to rejoice over the abortive bombardment of Fort McHenry, which elicited from Francis Scott Key, a prisoner of the British fleet, the best of our national songs, entitled "The Star Spangled Banner." This touching outburst of poetic patriotism was written just at the right time to solidify in one resolve all the floating aspirations of the defenders of the country ashore and afloat.[*] At this time the captured frigate *Guerrière,* then in commission under the command of Commodore Rodgers, was lying in Baltimore harbor, within hearing of the enemy's guns. The gallant commodore was no doubt sorely vexed that he could do no more on this occasion than organize some naval batteries ashore manned by his seamen. Two of his midshipmen, Field and Salter, of the *Guerrière,* were in command of these batteries, which together with others, manned by volunteer artillerists from Baltimore, ren-

[*] Rear-Admiral Preble informs us that this national song—"The Star Spangled Banner"—was first printed in a Baltimore newspaper under the more prosaic title "The Defense of Fort McHenry," and that the words were set to the music of an English drinking song entitled "To Anacreon in Heaven."

dered good service in repelling the attack upon the forts of the British fleet under Cochrane.

December, 1814. In the operations on the Mississippi for the defense of New Orleans, several young officers distinguished themselves. When Lieutenant F. Ap Catesby Jones (commanding five gunboats) was shot down on his boat, the command developed upon Midshipman Parker, "who defended his vessel until he was severely wounded himself and was overpowered by numbers." The English flotilla numbered between forty and fifty barges and boats, mounting 42 guns. The names of other midshipmen who distinguished themselves are not given in the books.

January 8, 1815. Commodore Daniel Patterson, in his report of the services of his officers and men, co-operating with the land forces, on the ships and in the marine battery and at the heavy guns on shore at the Battle of New Orleans, states that Midshipmen E. Watkins and J. Pelott, who were stationed at the heavy cannon in General Jackson's lines, "have, by their gallant conduct reflected upon the navy great credit and warranted my highest approbation."

The ship *Louisiana,* of 16 guns, covered the flank of the American lines, and it is stated that one of her guns in particular, commanded by Midshipman Philibert, "was served in a manner to attract general attention." The *Louisiana* threw 800 shot among the enemy, suffering but little in return. (Cooper.)

January 15, 1815. Capture of U. S. frigate *President,* 44 guns (Captain Stephen Decatur), by an English squadron.

The meeting and chasing of an American frigate by a squadron of the enemy was not an uncommon occurrence during the war. Gladly would Hull and Decatur have backed their top-sails to fight any one of their pursuers, if guaranteed against their overpowering odds of numbers, but such a contingency was impossible, and it only remained for each of those gallant commodores to exhaust all the resources of the seaman's art in saving his vessel from capture. Hull succeeded by marvelous skill and perseverance, but the circumstances were not so favorable to Decatur, who was obliged for the first time in his professional career to surrender his sword and ship to the enemy's overpowering force, after having disabled one of his pursuers, the frigate *Endymion.*

Unfortunately a 24 pound shot of the enemy killed, at his post

on the gun-deck, the fourth lieutenant of the *President*, Archibald Hamilton, who, as a midshipman of the United States had been greatly honored by Captain Decatur, and was one of the most popular officers in the navy to the day of his death on the *President*. This sad event, happening during a chase instead of a regular fight, cast a gloom over the whole ship, and the feeling was intensified by the wounding of Midshipmen Brewster and Richard Dale. The latter, who promised to be worthy of bearing his father's renowned name, lost a leg by the enemy's fire, which casualty is described in Captain Decatur's official report "as a circumstance to be particularly regretted, as he is a young man possessed of every quality to make a distinguished officer." This was great praise from such a commander, and it proves also that a midshipmen's leg was of some account in those fighting days, but it is passing strange that cannon balls in battle so often hit those who can least be spared. It appears, too, that Midshipman R. B. Randolph was considered worthy of the command of the forecastle division, which, says Decatur, "he managed to my entire satisfaction," and he adds, "from Mr. Robinson, who was serving as a volunteer, I received essential aid, particularly after I was deprived of the services of the master."

The capture of the *President* under such circumstances doubtless enraged as well as grieved her officers, who now, for the first time, had to endure the mortification of parole imprisonment in Bermuda, to which port they and their ship were taken. There were foolish braggarts there who uttered and published scurrilous remarks relating to the capture of the *President*, which were borne with manly fortitude, but when the imprudent editor of the Royal Bermuda Gazette undertook to make a false statement of an affair of honor in which Midshipman Randolph had been concerned, the latter high-spirited youth, accompanied by a messmate, Mr. Emmet, publicly horsewhipped the editorial offender (Mr. Ward), who was in company with Lieuteant Sammon, of the British Navy, but neither of the offenders present "interrupted or assisted in the operation." It is probable that Lieutenant Sammon, imbued with the prevailing feeling toward civilians, was quite as glad as was Midshipman Emmet to witness the castigation of a scribbler who ventured to meddle in or misrepresent the affairs of naval officers.

February 28, 1815. Capture of H. M.'s Ships *Cyane*, rating 24

but mounting 34 guns (Captain G. Falcon), and *Levant*, rating 18, mounting 21 guns (Captain George Douglass) by the U. S. frigate *Constitution*, rating 44, mounting 55, (Captain Charles Stewart), off the Madeira Islands. The midshipmen present on the *Constitution* on this occasion were: Edmund M. Russell, Horace B. Sawyer, James Taylor, Charles P. Durby, Alexander W. Luffborough, Pardon M. Whipple, James F. Curtis, William Steele, Frederick Varnum, Shubrel Pratt, William Taylor, George Leverett, John A. Wish, Z. W. Nixon, James W. Delany, Alexander Eskridge, Joseph Cross.

This favorite ship had, as usual, a large complement of midshipmen on board, of whom the seven last named in the list were already veterans in naval warfare, having been in the actions of the *Constitution* with the *Guerrière* and *Java*, and the other ten were under fire for the first time. Two of the former and one of the latter, transferred to the prize *Cyane* with Lieutenant Hoffman of the *Constitution*, were especially noticed in his official report to the Secretary of the Navy, as follows: "I cannot conclude my letter without particularly recommending to your notice Midshipman Joseph Cross, for whose unremitting attentions and exertions I feel myself greatly indebted; he is a young man, who, I think, would do honor to a commission. As to Midshipmen James Delany and James F. Curtis, and the few men under my command, words would be inadequate to express my gratitude towards them." This is very strong language on the part of Lieutenant Hoffman—a brave officer and a good judge of men in such an emergency. There can be no doubt that every officer who served in this lucky ship when she took the *Guerrière* in August, 1812, wanted to remain in her during the war, but this could not be permitted in view of the pressure of applications for orders to this noble frigate. She had a new commander (and some new lieutenants) in each of her three engagements, and the wonder is that as many as seven midshipmen had the good fortune to participate in them all. The lucky fighting ships favored by both officers and seamen in this war were the *Constitution*, *Wasp*, and *Hornet*, the unlucky ones were the *Chesapeake* and *President*, but no ship-of-war of any navy has ever been regarded with so much sailor-like attachment as "*Old Ironsides*." In her last engagement she was commanded by Charles Stewart, an acknowledged master of the seaman's art, who taught his subordinates on that memorable day that a single frigate well manned and handled may cope suc-

cessfully with two enemy's ships of greater combined man and gun power, and with the immense advantage of choosing their positions. In proof of the great odds against Captain Stewart, it may be mentioned that the *Cyane* in 1814 successfully kept at bay a French frigate of 44 guns, and a few years previously she engaged and beat off a frigate, a brig and five gunboats in the Bay of Naples, for which exploit her captain (Benton) was knighted. It was, in fact, the greatest surprise of this war of surprises, both in the result itself and in the cool masterly manner in which it was brought about. Stewart's first lieutenant, Henry E. Ballard, greatly contributed to the victory, and was rewarded for his valor and skill by Congress with a medal, and by his native State of Maryland with a handsome sword appropriately inscribed.*

An anecdote is told by an old-time American Consul at Gibraltar (Mr. Henry), illustrating the marked difference in temperament of two of the victorious commanders of the *Constitution*, Stewart and Bainbridge. During a cruise in the Mediterranean after the war, Commodore Stewart visited Gibraltar and spent a night at the hotel, and was roused from sleep by a messenger sent to inform him that his ship had dragged her anchors in a heavy gale then blowing and was ashore at Algeciras, to which alarming message the commodore gruffly replied, "Very well, sir, I'll know exactly where to find her in the morning," and then calmly closed his eyes again in slumber. His friend, Captain Bainbridge, however, while lodged at the same hotel during a storm, walked the floor of his room for several hours of the night in nervous apprehension of a possible disaster to his flag-ship.

March 23, 1815. Capture of H. M. brig *Penguin*, 16 guns, (Captain Dickenson) by the U. S. sloop of war *Hornet*, rated 18, mounting 20 guns (Captain James Biddle), off Tristan d'Acunha.

The following midshipmen were present in the *Hornet* in this battle: Adam Kuhn, William Boerum, William Skiddy, Samuel B. Phelps, Thomas A. Tippet, Joseph Smoot.

This last naval action of the war, fought after the treaty of peace had been signed, was one of the most decisive of its victories for the Americans, the enemy's vessel having been in the short space of twenty-two minutes dismantled and riddled with shot

*This sword is now in the possession of Dr. H. R. Walton, of Annapolis. The remains of Captain Henry E. Ballard, who died in 1855, were transferred July 29, 1884, to the Cemetery of the Naval Academy.

below and aloft, and finally scuttled and sunk. It is said that there was a 32-pounder on board the *Hornet*, one of whose shot carried away six legs of sailors of the *Penguin* and killed a powder boy besides. It was a very bad day for English legs, as two of her midshipmen also lost each a leg. The midshipmen of the *Hornet* had nothing to complain of on this score, and there is no mention in the dispatches of their services in the battle. It was a singular experience for all the officers of the *Hornet* to find on their return to port, that they had fought and won a battle after the declaration of peace between the two countries.

In this imperfect record of the services and casualties of the midshipmen of the War of 1812-15, we find abundant evidence of professional pride, devotion to duty and heroic deeds which would have done honor to their seniors in rank and years. Indeed it is doubtful if any other naval service can exhibit so creditable a record of its junior grade of officers. Surely no one can doubt that they contributed not a little to the glorious naval results of the war. It is a matter of fact that they were content to serve their country and risk their lives for a compensation of $19 a month. Unfortunately, those who wrote of naval affairs at that period made little or no effort to obtain particulars of the numerous acts of individual gallantry and heroism that must have occurred in the several engagements of that war. Clark, Bowen and the anonymous contributors to Niles' Register contented themselves for the most part with the facts and incidents stated in the dry official dispatches of the commanding officers. This would not have sufficed for the chronicler, and much less for the insatiate gatherer of news in our day, who would deem it duty to extract from soldier or sailor, officer or private, from wounded victims of the war in the hospitals, from prisoners of war in durance or from luckier ones who passed unscathed through the struggle, whatever of interest they might have to tell thereof. Even the most modest of heroic men or youths cannot in these days hide his deeds from the knowledge of the public. The lack of fuller details of the naval events of 1812 was due therefore to the habit of official and non-official writing of that day, which took notice of the doings of the higher officers chiefly, with only occasional allusions to the most conspicuous acts of individual midshipmen. In fact the distance between the commanding officer and his midshipmen was then so great that it was only through the lieutenants that knowledge of a midshipman's gal-

lantry in battle reached him, and the latter in their reports were as sparing of words and incidents as was the captain himself. It is not to be supposed, therefore, that the fortunate midshipmen mentioned in dispatches were the only ones worthy of eulogium. In all probability the sailors at the guns, in the tops and on the yards could have told many an interesting tale of the gallant behavior of the midshipmen, unnoticed by their superior officers. In none of the lists of midshipmen engaged in this war do we find the names of Percival, Sands, Engle, Forrest, Latimer, Stringham, Stribling, Tatnall, Ingraham and others of similar stamp and of that period, but who can doubt that, if engaged in any of the battles of that war, they too, gave evidence under fire, of the high qualities for which they were afterwards so distinguished. We feel amply repaid for the trouble of searching for and presenting in consecutive chronological order, even the meagre record above given, and we congratulate the corps of midshipmen that such paucity of detail and such neglect of their services cannot occur in any future naval war in which this nation may be engaged. There are still some living witnesses of the deeds of our midshipmen in the great war of the Rebellion, who will rescue them from oblivion. It is from word of mouth, rather than from stilted dispatches, that the most interesting incidents of any war are to be gleaned, and there are already indications in the full details of battles by land and sea given in the magazines of the day that neither the incidents themselves nor the merits of the individuals engaged therein will be neglected. These constitute the human interest in such struggles, which in time, perhaps, even the professional writers of dispatches may not disregard.

That the War of 1812 was a most instructive school for the young naval officers of that period is beyond question. In every way in which the knowledge of and practice in the profession could then be given, it was most fruitful, creating a standard of excellence in gunnery, seamanship and naval architecture, which could never afterwards be lowered without loss of prestige. It made our best and most experienced officers authorities in regard to all professional matters and competent to direct the building, armament and equipment of war vessels, as well as to aid in the general administration of naval affairs at Washington. In fact they were the means of putting afloat a new class of fighting ships, with great capacity for carrying heavy artillery.

This war was also full of suggestions and lessons to the other maritime foes of England, and especially to France, whose naval commanders were thenceforward inspired to fight their ships with greater obstinacy. It was also a great lesson to our own government, which perhaps realized for the first time the naval aptitude and nautical ingenuity and skill of our seafaring people. With a wholesome regard for the possibilities of the future, nearly all the American ships of war were kept almost continuously at sea after the peace of 1815, in order to educate the new generation of officers, and make the whole force ready for any contingency.

Great interest was taken in squadron exercise, which was then almost a novelty in our service. An officer of the *Enterprise*, stationed in the Mediterranean, writes enthusiastically of the progress made in this work, and adds: "It was a proud day for the young navy of the United States, when in September, 1815, there were anchored in the harbor of Gibraltar seventeen American men-of-war of the squadrons of Commodores Decatur and Bainbridge, a larger force than the whole of our navy at the opening of the war, on their way out of the Mediterranean after having settled some outstanding questions with the rulers of the Barbary States. In this fleet were the captured *Macedonian* and her captor, the *United States*, together with the *Constellation*, *Enterprise* and several smaller vessels that had been engaged in the victories on the lakes. It was a significant revelation of growing naval power to the mother country, whose great war minister, Canning, after the capture of the *Guerrière*, had vowed the total extinction of the upstart American Navy. In a few years thereafter, her best naval architects were compelled to acknowledge that the newly built American men-of-war that visited English ports were models of beauty and efficiency. Indeed they were spoken of as "Ambassadors from America representing the highest progressive skill in naval architecture." Such the majestic *Franklin*, 74, was admitted to be at Portsmouth, England, in 1818, and such, too, in reality was the superbly modelled frigate *Constitution*, as she lay unnoticed in the same harbor of Portsmouth previous to the war. Had the sapient naval architects of England then examined closely "*Old Ironsides*" and profited by the information, the vessels that met ours in battle might have made a better defense."

" James' Naval History, S. B. Luce.

In addition to the historical records, poems and songs that preserve the memory of the thrilling events of the War of 1812-15, pictorial illustrations of some of them were made by a struggling Italian artist known to old Newporters still living. Michele Felici Corné, an Italian decorative painter, came to this country in 1799, and was employed for some years in Salem and Boston decorating the interior of dwellings, with the assistance of his countryman named Bottomore, who was originally a confectioner. Both of them settled in Newport in[a] 1822, the former in the little stone house in the street still bearing his name, and Corné, who had developed a talent for marine painting, turned the still prevailing interest in the naval battles of the War of 1812-15 to good account in a succession of naval battle-pictures of considerable merit which were much prized by their purchasers, and by the public. His friend Bottomore, catering to the same patriotic spirit, made artistic representations of these battle-pictures in sugar, which graced many a festive board in the old city by the sea.[b]

The subjects of Corné's pictures were as follows:

1. The Combat between the *Constitution* and *Guerrière*.
2. The *Constitution* taking the *Cyane* and *Levant*.
3. The fight between the *Peacock* and *Epervier*.
4. The Boarding of the *Frolic*.
5. The Surrender of the *Java* to the *Constitution*.
6. The Fight between the *United States* and *Macedonian*.
7. The *Hornet* sinking the *Peacock*.
8. The Battle of Lake Erie.
9. Two separate views of Commodore Perry's victory.
10. The *Chesapeake* and *Shannon*.
11. The *Enterprise* and *Boxer*.

Engravings of some of these battle-pictures are to be found in Abel Bowman's "Naval Monument," Boston, 1816, and in John W. Davis' "Naval Temple," 2d edition, Boston, 1816. The frontispiece in the former, representing the return from the Mediterranean in 1815 of Commodore Bainbridge's squadron of thirteen vessels, sailing in three columns, is from a sketch by Mr. Fanning taken from actual observation. This engraving is given

[a] Corné and Bottomore lived in a small stone house in the street still bearing the name of the former. He died there in 1845, in the 83rd year of his age, and Bottomore inherited his estate.

[b] See George P. Mason's "Reminiscences of Newport," 1884.

also in the Naval Temple from a painting by Corné. The latter also contains engravings described as follows:

1. The Escape of the *Constitution* from a British squadron of five ships after a chase of sixty hours. (William Hoagland, Eng.)

2. The Fight between the *Chesapeake* and *Shannon*. (Wightman, Eng.)

3. Commodore Perry's Victory on Lake Erie. (W. B. Annin, Eng.)

4. Commodore Perry's Squadron—representing Perry passing in his boat from the *Lawrence* to the *Niagara*. (W. B. Annin, Eng).

5. Commodore McDonough's Victory on Lake Champlain. (William Hoagland, Eng.)

Both of these publications,[*] long out of print, containing the freshest account of the naval operations of the war, outside of official dispatches, were read with great avidity by the patriotic citizens who had the pleasure of welcoming home from those triumphs the gallant officers and seamen of "our little navy." The people of the United States, proud of these, their heroes, showered upon them the tokens of gratitude and admiration in every port along the seaboard. Portraits of several of these naval commanders are still hung in the picture gallery of the City Hall in New York—painted at the expense of the city, and it is worthy of remark that the principal cities of that period anticipated the Government of the United States in the bestowal of substantial testimonials of respect to these heroes.

Although the bloody work of war is not calculated to awaken the tuneful lyre of actual combatants, it seldom fails to inspire the martial muse of scholarly men remote from the scene of hostilities or witnesses of the same. In the young American nation, however, absorbed in the hazardous work of defending itself against powerful assailants, there were but few men who had the inclination or the faculty of writing martial verse on any subject. So great was our poverty in this field during the Revolutionary War that the patriots were obliged to appropriate from a foreign source as a national war song, "Yankee Doodle," which was followed in the French quasi-war by Hopkinson's original American national song, "Hail Columbia," and it was in the midst of our greatest war (1814) that the second and

[*] Bowen's "Naval Monument" contains a list of honors and awards to naval officers, pp. 281-96.

perhaps the best of our national war songs was written. During the bombardment of Fort McHenry (September 13, 1814), by the British fleet under Admiral Cockburn, the young Baltimorean, Francis Scott Key, a prisoner on board a small vessel of the fleet, wrote on the morning of the 14th the "Star Spangled Banner," out of the fullness of a heart overjoyed at seeing the flag of his country still waving over the battlements of the fort. At the close of the war, an enthusiast, whose name is unknown to us, celebrated the whole category of the naval victories of that war in the following glorious rhymes, which were sung by our sailors for many a day thereafter, and it is hoped, will be sung again by the crews of our new navy:

COLUMBIA'S SONS AT SEA.

Air Pizarro.

In chorus now join, while my hobby I sing
'Tis the deeds of our Tars that have made the world ring.
For is it not true where their flag is unfurled
Its stars have beamed glory to dazzle the world.

First Dacres, who thought he the Yankees could scare,
Proudly wrote on his sails—"I'm the Famed *Guerrière.*"
Says Hull, are you there, so together they pull'd,
In forty-five minutes the *Guerrière* was Hull'd.

Next Jones in the *Wasp*, with long sting in the tail,
Cried "Luff up, my boys, 'tis an enemy's sail."
Soon he got alongside, and his broadsides let fly
And in less than an hour knock'd the *Frolic* sky high.

Then the dauntless Decatur, the champion of right,
The proud *Macedonian* encountered in fight;
And he who had asked for more worlds to subdue
Found a New World that his business could do.

See the proud *Constitution*, our Country's great pride,
With Bainbridge at helm, in true majesty ride,
And pour from her sides a hot stream of red lava
That scorched and dismantled His Majesty's *Java.*

Now Burrows the valiant in the trim *Enterprise*,
His skill with a true English *Boxer* he tries;
Though he ne'er learned the art from Mendozas or Cribbs,
Yet he pounded her so that he broke all her ribs.

Then the *Peacock* was strutting about in his pride,
When the *Hornet* pounced down upon his starboard side,
And stung him so sore that he bellowed with pain
And Lawrence the bold saw him sink in the main.

From its ashes a Phœnix old Neptune soon rear'd,
And tho' called the *Peacock*, a new bird appear'd
Who quick to his own and brave Warrington's fame,
Made prize of a hawk with a Frenchified name.

And now we've a *Wasp* of such wonderful force,
As Blakeley can tell, e'en to stop river's course;
Since the *Avon* no longer can run to the sea
Nor the *Reindeer* on the plain without a prey.

Winged Hermes, the light finger'd God of the Greeks,
Seized the trident of Neptune in one of his freaks.
A brave Alabamian his god-head defies
And sent Mr. Mercury back to the skies.

And now I would sing of the fight of Champlain,
And with Erie's bold Heroes ennoble my strain.
But the rapid destruction of Britain's proud fleets
My pow'r of description, my rhetoric beats.

But hark again, braves! 'tis *Old Ironsides'* roar,
Her terrible guns shake the ocean and shore,
And Stewart fires right and left into the foe
And takes the *Levant* and *Cyane* too in tow.

And last though not least has the *Hornet* again
Met the insolent foe on the boisterous main,
And in twenty-two minutes with some broken bones
Biddle sent the poor *Penguin* to old Davy Jones.

To Britons, however, I give their just due,
For bravely they fight, aye and skillfully too;
It was Greek meeting Greek in the hard tug of war,
But the Yankee soon proved the best Grecian by far.

Though Valor her temple has formed in the breast
Of each native Tar, yet the pride of his crest
Is the fair star of mercy that shines ever bright
To cheer the lorn captive subdued in the fight.

But hold! should I sing every Hero of fight,
My song would prevent you from drinking all night,
Then fill every glass to the True Sons of Mars
The Heroes of Ocean—Columbia's brave Tars.

"A score of poets," says Lossing, "caught inspiration from the shouts of triumph that filled the air," after these several histories, and the newspapers hastened to publish them—some were sung at banquets of the officers—many of the songs he quotes from, have no names attached, simply "Old Song."

Many songs were written commemorative of Hull's, Decatur's and Bainbridge's victories.

The victory over England's *Guerrière* was celebrated in popular songs, which, says Rear-Admiral Luce, were sung at public dinners, public meetings and throughout the navy, the favorite one being "The Constitution and the Guerrière," set to the old tune "A Landlady of France, She Lov'd an Officer so Gay."

McDonough's victory on Lake Champlain was the subject of one of the most popular songs of war—it was sung by its author, Micajah Hawkins, in the character of a negro sailor, it being written in the negro dialect. Lossing gives it entire.

When these stirring victories were won, Dibdin's sea-songs celebrating the previous triumphs of the British Navy, were "at the height of their popularity," says Luce, and may have stimulated some of our poetasters to venture upon the composition of sea songs.

Although we had no Dibdin, nor one hundredth part of the inspiration that stirred his nautical muse, there were spirited naval songs of triumph composed and sung during and after the war which kept alive the memory of the events, and if devoid of poetic merit, had the ring of the sea in them, which was all that was desired. There were some songs of victory, and several odes to favorite heroes (Porter), elegaic poems to the memory of captains killed in battle (Lawrence, Allen, Burrows), and a couple of general glorificatory sketches of the whole war.

The following ode, written by a student of Harvard University and sung at the celebration of the peace at said university, shows a cordial reciprocation of kindly sentiments, and evidence of manly and generous feeling on our side.

1. Columbia and Britannia
   Have ceas'd from warfare wild;
   No more in battle's rage they meet,
   The parent and the child.
   Each gallant nation now laments
   The heroes who have died;
   But the brave, on the wave
   Shall yet in friendship ride,
   To bear Britannia's ancient name,
   And swell Columbia's pride.

2. The flag-staff of Columbia,
   Shall be her mountain pine;
   Her commerce on the foaming sea,
   Shall be her golden mine.

Her wealth from every nation borne,
Shall swell the ocean wide,
And the brave on the wave, etc.

3. To Britain's Faith and Prowess,
Shall distant nations bow;
The Cross upon her top-mast head,
The lion at her prow,
No haughty infidel shall dare insult,
No infidel deride;
For the brave, on the wave, etc.

4. For now the *kindred* nations,
Shall wage the fight no more;
No more in dreadful thunder dash,
The billows to the shore:
Save when in firm alliance bound,
Some common foe defied;
Then the brave, on the wave
Shall there in friendship ride,
To bear Britannia's ancient name,
And swell Columbia's pride.

There was not universal satisfaction, however, with the results of the war, as appears from the opening lines of a poetic complaint:

The people much rejoice to see
A hopeless war is ended;
But in the Treaty none can see
A single thing amended.

So numerous were the trophies captured by our naval commanders and by their brothers of the army in this war, that Congress passed an Act (April 18, 1814), directing the Secretaries of War and of the Navy to collect and transmit all captured flags, standards, to the President of the United States "for the purpose of being, under his direction, preserved and displayed in such places as he shall deem proper." It is probable that the flags captured at sea were in accordance with the resolution, deposited in the Navy Department in charge of the Secretary of the Navy, but no special pains were taken to exhibit or preserve them until 1849, when they were found in the garret of the Navy Department, much damaged by the destroying hand of time. Only six of the many flags and standards taken by our army during the Revolution remained in the office of the Secretary of War in 1814, and at that date the Navy Department had no information

of any of the many naval flags captured previous to the War of 1812 except that of the *Insurgente*.[88]

Very different was the treatment by the British of the American Army flags captured by them at different times, which, it may not be generally known, are still exhibited in the chapel of the Military Hospital, Chelsea, London. But the young Republic of that day, unambitious of military renown, seemed not to value the trophies of war after having won its battles. Captured flags and standards, so jealously guarded by the older nations of Europe, were not yet looked upon in America as the insignia of national fame and power. Nor was it until the nation had another trial of its military strength and skill in the Mexican War that the authorities took measures to rescue those valuable treasures from destruction. It is sufficiently evident, however, that the brave men who won them were not neglected, and that there were found in the naval operations of the war all the elements and considerations that quicken the minds, ennoble the souls, and mould the character of seamen young and old.

What examples and what stimulus, converting boys into men, and young men into heroes—the best type of the fighting naval officer as example—the fruits of self-teaching, combined with intelligence—the grand patriotic spirit actuating them—the comparative freedom from petty jealousies—can or does scientific culture produce such. May we ever have such men and officers to command our ships!

Such were the advantages of practical instruction and training enjoyed by the midshipmen of our earliest naval armaments, in all the various duties of their profession in war and in peace. They were the best types of fighting midshipmen that any navy could boast of, which was partly owing to their own intelligence

[88] Preble, in his "History of the American Flag" states that what was left of John Paul Jones's flag, hoisted on the *Bon Homme Richard* in her fight with the *Serapis* (September 23, 1779), was presented in December, 1784, by the Marine Committee to James Bayard Stafford, a volunteer lieutenant on board the former vessel, who, when the flag was shot from the mast of the *Bon Homme Richard*, jumped overboard and recovered it, and while climbing up the side of the ship had his shoulder cut in two by a British sailor. This flag, which was about the size of a boat ensign, is still preserved by his descendants, and was seen at the Centennial Exhibition. It is proper to add that some doubts have been expressed as to the authenticity of this flag.

and spirit, and partly to the cause for which they were fighting and to the example of their commanding officers.

This school of actual warfare was precisely what was needed for the moulding and training of young officers and for the building up of a naval personnel and material of which the country would be proud. And well was this important work done by all concerned. The calm confidence of the young commanders, their superior skill as disciplinarians, the rapidity and accuracy of their fire, inflicting great damage and loss of life upon the enemy with comparatively small damage and few casualties on their own vessels, the brevity of the actions, the universal good conduct of officers and men, and the great humanity of the American captains in the hour of victory, justify us in presenting the War of 1812-15 as a model school of training and instruction for all time. But in the beginning of their career, there were many serious difficulties to be overcome. Upon receiving the coveted midshipman's warrant from the Secretary of the Navy, its proud possessor was hurried on board of some vessel fitting out for active service, and in most cases without any preparation for so important a change in life. Thus, ignorant of the laws, customs and routine of the Navy—without even the consoling aid of a nautical primer or text-book—he was at once required to assume the cares and responsibilities of a naval officer. Ridicule perhaps greeted his first efforts in the service. It was no unusual thing in those days for a newly appointed midshipman to keep a night watch aloft in a gale of wind, or to receive his first baptism of fire, before getting his "sea-legs." Midshipman Farragut was only 11 years of age in his first fight in the *Essex*. Stringham only 13 in his first fight, and many others distinguished themselves in battle while yet in their teens. Fortunately for the midshipmen, perhaps, the enemy's gunnery was generally ineffective, otherwise many more of them would have lost their lives. In these and other trying situations the midshipman had to depend mainly upon himself. Occasionally a rough, but tender-hearted boatswain's mate would aid him in "learning the ropes," and perhaps a kind lieutenant of the watch would facilitate the performance of his duties by friendly advice, and when wet and wearied with the vigils of the night, would send him below "to watch the cable" in his hammock. There, dreaming of home,

he was to be envied even by the sleepless monarch—Henry IV—who is pictured by Shakespeare thus vainly wooing slumber:

> Canst thou, O partial sleep, give thy repose
> To the wet sea-boy in an hour so rude;
> And, in the calmest and most stillest night,
> With all appliances and means to boot,
> Deny it to a King?

Their mess-room, since known by the name "steerage" in our navy was a gloomy, uninviting den, furnished with a plain deal table made fast to the deck, a dozen or more camp stools and lockers just large enough to stow away the scanty wardrobe of each midshipman. Yet they were for the most part contented with their lot, and what with "Saturday nights at sea," dinners to Dutch and English midshipmen, duels at Syracuse and Malta, and balls at Port Mahon* they were able to vary the monotony of sea life.

Nor were instances of consideration for youth very common in our service. Indeed, the American midshipman of this fighting period did not expect much indulgence at the hands of his superior, but bore privation and punishment with equal fortitude. He was fed chiefly upon the purser's stores of salt-horse, hard-tack and rice, with a course of duff, dunderfunk, skillagalee, or dough-boys, to enliven the repast, and he chewed strong tobacco, drank stronger rum out of tin cups and swore at the sailors with great gusto. There was nothing in the Articles of War forbidding these nautical habits, and if, during the boisterous proceedings of the traditional Saturday night at sea, they were moved to rail at slavery or hurl anathemas at the occupants of the ward-room or cabin, it was done in ship-shape style in strong Anglo-Saxon language. Nor was this den exempt from the tyrant's rule. We have been told by a veteran officer whose

*The fine harbor of Port Mahon, on the island of Minorca, was the rendezvous of our squadrons during the wars with the Barbary powers, and it continued to be frequented by our cruisers, as a depot of supplies and winter station, with the permission of the Spanish Government, until 1849, when a more central and convenient rendezvous for our Mediterranean squadron was found in the harbor of Spezia, on the coast of Italy, between Genoa and Leghorn. There, by permission of the Sardinian Government, in spacious buildings on shore, the supplies for the squadron were stored until 1866, when the designs of the Italian naval authorities in regard to this splendid harbor compelled the removal of supplies for the United States squadron to a store-ship, which since that time has been stationed in the Tagus near Lisbon, and later, at Villefranche.

memory dated back to that period, that might prevailed over right in "steerage," although it was not enforced by the instruments of torture used in the British Cockpit, such as the "caterer's colt," sometimes called the "persuador," or the "boot-jack," whose sway is thus touchingly sung by an anonymous poetic sufferer:

> Oh, well do I remember the jovial reefer's berth,
> Where mischief sways the Sceptre—prime minister was mirth,
> The boot-jack with its horse-shoe end clings to my mem'ry yet;
> I've felt the smart on my nether part, then how can I forget?

In the "steerage" of a ship-of-war, or in the college campus, or wherever young men are assembled together, the strong will and strong arm must rule, and so deeply is this principle implanted in masculine nature that not even the most improved system of collegiate discipline can totally eradicate it. Perhaps in schools of military and naval training it may be advisable not to attempt to crush this spirit, but only to curb it within certain limits.

The duties of midshipmen at this period, although for the most part mechanical, such as communicating orders, taking charge of boats, keeping watch alow and aloft, &c., were nevertheless a severe test of youthful mettle. Some of these duties were attended with danger, others required no little bodily endurance, others required the rare quality of presence of mind, while to the correct performance of each there was attached a responsibility of the gravest character.

Once familiar with the routine of duty at sea, the midshipman's attention was directed to the great gun exercise, in which, owing to the frequency of drill in this arm, he became quickly proficient. Of practical seamanship, he learned not a little from the old tars of the forecastle watch, and from constant observations of the maneuvers executed by the envied lieutenant in charge of the deck. Of naval science he was, of course, blissfully ignorant, and of the dozens of English, French and Spanish text-books then in use in Europe, he had no knowledge, excepting perhaps some stray copy of Moore's Navigation, or of the Seaman's Daily Assistant, and a shaky sextant or quadrant,[99] which occasionally

[99] The faulty condition of nautical instruments during this period of active hostilities at sea, may be judged from the fact that even as late as 1814 the British Government offered a large reward for the improvement of chronometers. This had the desired effect, as we learn that, in 1820, three chronometers which had been used in the Arctic regions for eighteen months were taken back to England without altering their rates more than a few seconds of time.

found their way into the steerage, and with their aid, some daring reefer would perform the astonishing feat of taking an altitude of the sun. If, perchance, he at last succeeded in worming out of the sailing master the secret of his art—still most jealously guarded—the audacious youth became at once the oracle of his messmates and dreamed of fame like that of Columbus. At the end of the cruise, he did not disdain to add to his store of nautical science by private tuition or attendance at some one of the humble schools on the seaboard in which the navigator's art was imperfectly taught by retired shipmasters.[91] But the great majority of the midshipmen contented themselves with what information they could pick up about the decks of the ships in which they sailed, and were disposed to ridicule any display of book learning on the part of their more studious messmates. Thus cruise succeeded cruise, with brief intervals of recreation ashore, during which the reefers sported their gay uniforms, captivating then, as now, the hearts of susceptible young maidens, and squandering nineteen dollars per month in the pleasures and dissipations of city life. Gallant and thoughtless, like the reefers of Falconer's day, they fought at sea and flirted on shore, passing through the intermediate stages of mates of watches and masters' mates to the coveted dignity of lieutenant, in which grade, with the pay of $40 per month and three rations per day, with a gorgeous epaulet on the left shoulder, and perhaps a fair mate and embryo middies at home, they practiced the art of command, and

[91] There was a school of this sort on the Thames River, near New London, Connecticut, kept by Captain Nathan Daboll. Midshipman Charles Morris attended Hamilton Moore's school at Norfolk, Virginia. In his autobiography as published by Soley, Morris says: "My instructor was both ignorant and indolent, and my time was consequently spent to very little advantage for the few weeks I was with him." Another school was opened previous to the War of 1812, on Long Wharf, in the city of Newport, Rhode Island, by Captain Finch, a well known shipmaster of that day (who was succeeded by Captain Allen), and it was in this school that Farragut, Stringham, Montgomery and other ambitious midshipmen took lessons in navigation. Young Decatur and his friends, Stewart and Somers, went to a school near Philadelphia, kept by Talbot Hamilton, a former officer of the British Navy, while others were taught in Dr. Hunter's school at the Washington Navy Yard, or in Captain Gordon's school. In the "Newport Mercury" of 1790, the "Seaman's Daily Assistant" is advertised for sale among the wares of a Newport Merchant's Variety Store.

prepared themselves for the honors and responsibilities of a captain's commission.

It must be admitted that the professional career of young officers during the first two decades of our naval history embraced advantages and obstacles rarely combined in any other calling, and it is creditable to the pluck and manhood of the midshipman of that day that so few of them faltered or failed in the opening of so difficult a career to reach the object of their ambition. Many of course, dropped out on the way to higher rank, but not as many in proportion as disappear in our day. Theirs was daily self-education of the kind then needed—in veritable schools of naval warfare—not a mere cramming of facts and principles into the brain, but a development of the whole man in a practical direction, enabling him to respond to all the demands that were made upon his intelligence as a seaman and an officer. Nothing more was then required of him. But upon the advent of a peace that promised to be lasting, the functions of the navy became enlarged and something more than seamanlike skill was required of all its officers, to enable them to keep pace with the progress of the age. If the gallant captains who served in our naval wars had been well informed concerning the rights of neutrals and belligerents and other questions of maritime law, many blunders, surrenders and disasters might have been avoided. The want of general mental culture, and of theoretical instruction in their profession began to be felt among old and young officers, the latter of whom looked hopefully to Congress for the desired relief. But many years were yet to elapse before the adoption of an organized *system* of naval education. During the interval, feeble attempts in this direction were made by the Navy Department, and the subject was agitated by the most advanced minds in Congress, in the navy itself, and by each succeeding Secretary of the Navy until finally, in 1845, one of the latter, despairing of any favorable action on the part of Congress, took the responsibility of founding at Annapolis, in Maryland, a school, which, though humble in its origin, is now recognized as one of the great institutions of the country. It is due to the most prominent advocates of this good cause, that their efforts in its behalf should be faithfully recorded.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

GRAPHIC REPRESENTATION OF THE RELATION OF PRESSURES AND SHRINKAGES OF BUILT-UP GUNS FOR THE STATES OF ACTION AND REST.

By LIEUTENANT-COMMANDER LOUIS M. NULTON, U. S. Navy.

1. **Object of the Diagram.**—The object of this diagram is to show, graphically, how any one element of the strength of a gun, such as shrinkage, pressure in the bore, pressures at contact-surfaces, in action and at rest, is related to every other element and how a modification of one element affects the others. It is an attempt to show, graphically, in principle, the coordinate relation of all conditions of the parts of the gun cylinders between the states of action and rest and the limiting conditions for both of these states. It is designed to assist those who, for the first time, are undertaking the study of the elastic strength of guns.

No attempt is made to deduce formulæ used, reference merely being made to authorities in which they may be found. The notes, in general, are coordinated with the text of "The Elastic Strength of Guns, 1st edition, 1904," by Professor Philip R. Alger, U. S. N.

2. **One Cylinder.—Strains.**—With reference to gun construction, a simple cylinder under pressure may be overstrained in two directions, viz., (1) in the direction of a radius, (2) at right angles to the radius or circumferentially. These strains may be (1) a radial strain of compression, (2) a radial strain of extension, (3) a circumferential strain of compression, and (4) a circumferential strain of extension.

In gun construction, we may not admit, in any case, that the limit of circumferential extension can be safely exceeded for any part of the system.

3. **Pressures.**—Radial and circumferential strains may be produced, (1) by a pressure P_0, inside the cylinder, tending to burst

it, or, (2) by a pressure P_a, outside the cylinder, tending to collapse it, or, (3) by a combination of these two pressures acting at the same moment.

In these notes pressures producing circumferential strains are denoted by the suffix (θ) and those producing radial strains by the suffix (ρ).

4. Internal Pressure.—When an internal pressure acts alone, the value of the pressure which will just bring the material of

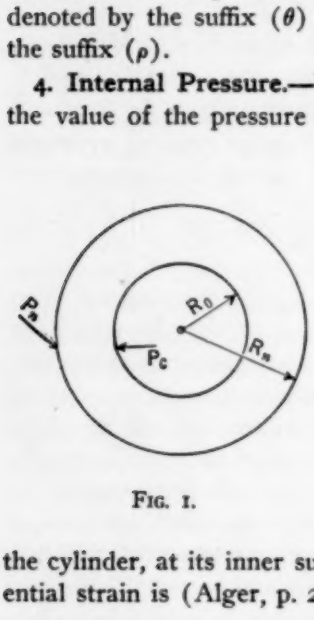


FIG. 1.

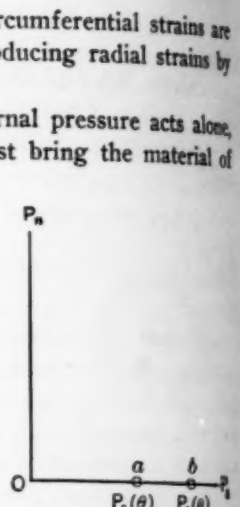


FIG. 2.

the cylinder, at its inner surface, to its elastic limit of circumferential strain is (Alger, p. 27 (20)),

$$P_0(\theta) = \frac{3\,(R_a^2 - R_0^2)\,\theta}{4R_a^2 + 2R_0^2} \qquad (1)$$

and that pressure which will just bring the inner surface to its elastic limit of radial strain is

$$P_0(\rho) = \frac{3\,(R_a^2 - R_0^2)\,\rho}{4R_a^2 - 2R_0^2} \qquad (2)$$

in which θ and ρ are the elastic limits of the material of the cylinder under tension and compression, respectively, as determined in a testing machine.

Assume now two axes at right angles, on one of which is measured internal pressures, and on the other external pressures.

Plot on these the values of P_0 as determined by equations (1) and (2). In this case, as only internal pressure is acting, $P_a = 0$ and equation (1) will give a value of $P_0(\theta)$ equal, we will assume to *Oa*, Fig. 2.

Before plotting the value of P_0 from equation (2) we must

compare the value of θ and ρ. In the case of forged steel used in modern gun construction, these elastic limits are usually taken to be equal, but with some materials, notably cast iron, ρ is considerably greater than θ, and even in the case of steel it is probable that ρ is always somewhat greater than θ.

Remembering this, a comparison of the denominators of equations (1) and (2) shows that $P_0(\rho)$ for this case is greater than $P_0(\theta)$ and will plot at b some pressure *greater* than Oa.*

Recalling now the statement made in the earlier part of the text that in gun construction a cylinder must not under any circumstance be subjected to a pressure which will overstrain it circumferentially, a glance at Fig. 2 shows that as far as the utility of this one simple cylinder, as a gun complete in itself is concerned the interior pressure due to the powder must not exceed $P_0(\theta) = Oa$, Fig. 2, and that all pressures between a and b overstrain the cylinder circumferentially, and are therefore unsafe.

The outside, or last exterior, cylinder of a built-up gun works under identically the same condition as we have here considered, and, in gun construction, its strength is determined by that value of the interior pressure which will just bring the inner surface to its limit of circumferential extension.

5. **External Pressure.**—Consider now the same simple cylinder subjected only to an external pressure P_n.

The value of this pressure which will just bring the inner surface of the cylinder to its elastic limit of circumferential strain is (see Alger, p. 30 (24))

$$P_n(\theta) = \frac{(R_n^2 - R_0^2)\,\rho}{2R_n^2} \tag{3}$$

and the value of the pressure which will just bring the inner surface of the cylinder to its elastic limit of radial strain is (Alger, p. 30 (25))

$$P_n(\rho) = 3\left[\frac{(R_n^2 - R_0^2)\,\rho}{2R_n^2}\right] \tag{4}$$

Plotting these values on a diagram similar to Fig. 2, we have, P_0 now being zero, Fig. 3.

A comparison of (3) and (4) shows $P_n(\rho)$ to be three times greater than $P_n(\theta)$, but, as it is not admitted, under any circum-

*The only excuse for inserting a diagram of such simplicity in this text is to logically lead to the complete graphic representation of all equations.

stances in gun construction, that we may allow our cylinders to be overstrained circumferentially, the strength of the cylinder for our purpose is given by the value of $P_n(\theta) = Oc$, Fig. 3.

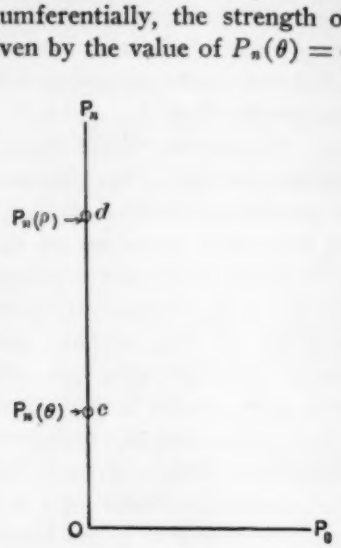


FIG. 3.

This is the condition of the tube, or last interior cylinder, of a built-up gun in the state of rest in which the powder pressure ceases to act in the bore.

6. Both Internal and External Pressure Acting on a Single Cylinder.—Consider now the case in which both internal and external pressures are acting together, and assume the case in which the internal pressure is greater than the external. This is the case when the powder pressure acts in the bore.

When P_0 is greater than P_n, the case we assume, there are two equations expressing the greatest allowable value of P_0. They are (see Alger, pp. 33, 34)

$$P_0(\rho) = \frac{3(R_n^2 - R_0^2)\rho + 2P_nR_n^2}{4R_n^2 - 2R_0^2} \tag{5}$$

and

$$P_0(\theta) = \frac{3(R_n^2 - R_0^2)\theta + 6P_nR_n^2}{4R_n^2 + 2R_0^2} \tag{6}$$

The first of these gives the value of that pressure inside the bore, P_0, which acting with P_n, will bring the cylinder, at its inner surface, to its elastic limit of strain by radial compression; the second

gives that value of P_0 which will bring the inner surface to its elastic limit of strain circumferentially. The least of these two values of P_0 is the true value of the maximum *allowable* internal pressure, but, since which of them will be the least depends upon the values of P_n, R_n, and R_0, both are expressed.

For a particular cylinder, *i. e.*, fixed values of θ, ρ, R_n, and R_0, these equations take the form

$$P_0(\rho) = B + CP_n \tag{7}$$

and

$$P_0(\theta) = A + DP_n \tag{8}$$

in which A, B, C, and D are constants depending upon the values of R_0, R_n, θ, and ρ. In modern gun construction θ is usually equal to ρ.

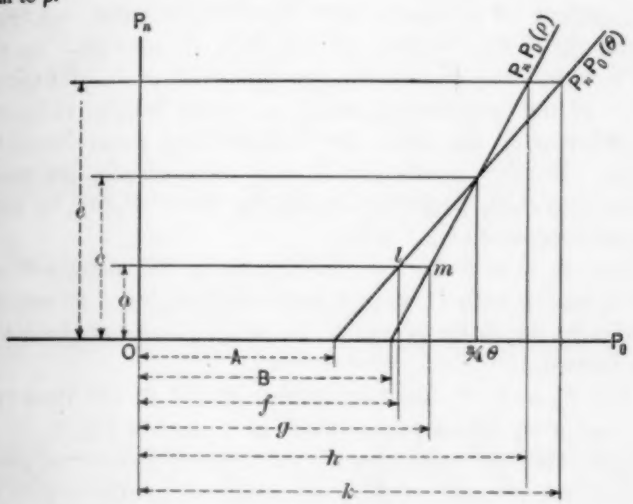


FIG. 4.

Equations (7) and (8) are equations of two straight lines which do not pass through the origin. These may now be plotted as shown in Fig. 4. Fig. 4 is the same as Fig. 8, p. 34, Alger's Elastic Strength of Guns, and it is this figure which is the basis of the final graphic solutions. The heavy lines given in Fig. 4 are plotted from equations (7) and (8). That marked $P_nP_0(\rho)$ is plotted from equation (7), and, for any point on this line, its ordinate will give that value of P_n, and its abcissa that value of P_0, which, *acting together* will just bring the inner surface of the cylinder to its elastic limit by radial compression. The line

$P_nP_0(\theta)$ is plotted from equation (8) and its ordinates and abcissæ give coincident values of P_n and P_0 which will just bring the inner surface of the cylinder to its elastic limit of strain by circumferential extension.

This diagram, at a glance, furnishes the following information:

If the external pressure on the cylinder be a tons per sq. in. what values may P_0 have? From $P_n = a$, draw a horizontal line until it cuts the heavy lines at l and m. There are thus two values of P_0, one $P_0 = f$ tons acting with $P_n = a$ tons will bring the inner surface of the cylinder to its elastic limit by circumferential extension, and another, $P_0 = g$ tons, which will bring the inner surface to its elastic limit of strain by radial compression.

Similarly if $P_n = e$ tons per sq. inch, P_0 may have the value h, or k, tons. It is to be noted, for this value of P_n, that the inner surface of the cylinder will reach its elastic limit of radial strain before it reaches the elastic limit of strain by circumferential extension. In other words, for $P_n = e$, the horizontal line through $P_n = e$ cuts $P_nP_0(\rho)$ before it cuts the line $P_nP_0(\theta)$, the reverse of what happened at $P_n = a$.

When $P_0 = \frac{3}{4}\,\theta$ the lines cross, and at this point a value of $P_n = c$, acting with $P_0 = \frac{3}{4}\,\theta$, will bring the inner surface of the cylinder to its limits of radial and circumferential strain at the same instant.

When $P_n = 0$, P_0 has two values, A and B, and these values are those of equations (1) and (2) as plotted in Fig. 2.

This figure also shows how the existence of an external pressure increases the strength of the gun and allows greater powder pressures to be used in the bore, for when $P_n = 0$, $P_0 =$ either A or B, and when $P_n =$ any value greater than 0, P_0 becomes greater than A or B, *i. e.*, it allows a greater value of pressure in the bore before the cylinder at its inner surface is strained to its elastic limit radially or circumferentially.

7. How P_n is Developed in Gun Construction.—Resting temporarily from consideration of Fig. 4, consider again the simple, single, cylinder as being at rest free from all pressure. Suppose there is slipped over the outside of the first cylinder another cylinder which just nicely fits the first cylinder while it is at rest free from all pressure. Let this second cylinder, called the jacket, just touch every point at its surface of contact with

the first cylinder, hereafter termed the tube, without exerting any pressure, both of them being in the free normal condition of the metal of which they are composed. Now let a pressure, P_0, be gradually developed inside the first cylinder, *i. e.*, inside the tube.

As this pressure arises the tube will expand, and as it expands it will be resisted in its attempt by the restraining influence of the jacket and a pressure thus set up at the surface of contact. There is thus produced an external pressure on the tube.

As P_0 increases the tube will tend to further expand, the jacket will further resist this expansion and there will be developed a further increase in pressure at the surface of contact of the jacket and tube.

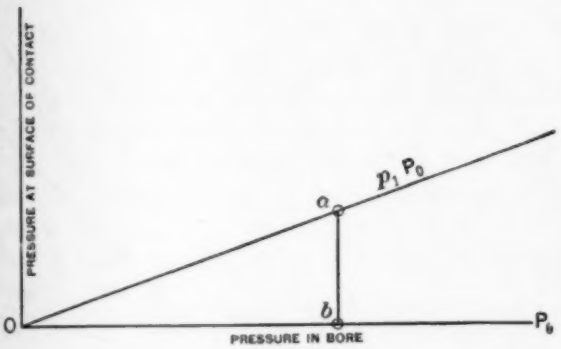


FIG. 5.

Let R_0, R_1, and R_2 be the radii of the tube and jacket, respectively, θ and ρ the elastic strength of the tube material, and let p_1 be the pressure at the surface of contact as developed by the action of P_0 in the interior of the tube, *i. e.*, in the bore.

The value of p_1 is given by the formula (Alger (34), p. 41)

$$p_1 = \frac{R_0^2 (R_2^2 - R_1^2)}{R_1^2 (R_2^2 - R_0^2)} \times P_0 \qquad (9)$$

For our compound cylinder of definite radii, the pressure developed at the surface of contact (whose radius is R_1) is by (9) a fixed fraction of the internal pressure which develops it, and equation (9) may be plotted as a straight line, as shown in Fig. 5.

In Fig. 6, are combined Figs. 4 and 5, to consider the strength of the tube as affected by the pressure p_1 developed at the surface of contact of the tube and the jacket.

Before discussing Fig. 6, a comment must be made upon the notation used in Figs. 4 and 5. All lines are designated by the quantities by which they are plotted. Thus, p_1P_0, Fig. 5, is plotted with values of P_0 as abcissæ and coincident values of p_1 as ordinates. It is to be noted, too, that as far as the tube is concerned p_1 is a particular case of external pressure for the tube. P_n has been used to designate external pressures in general on the tube.

Consider now the line p_1P_0 in Fig. 6. When the pressure in the bore has reached a value $P_0 = Ob$, the line p_1P_0 merely shows that the external pressure, p_1, at the contact surface, due to the restraining influence of the jacket has reached a value $p_1 = ba$.

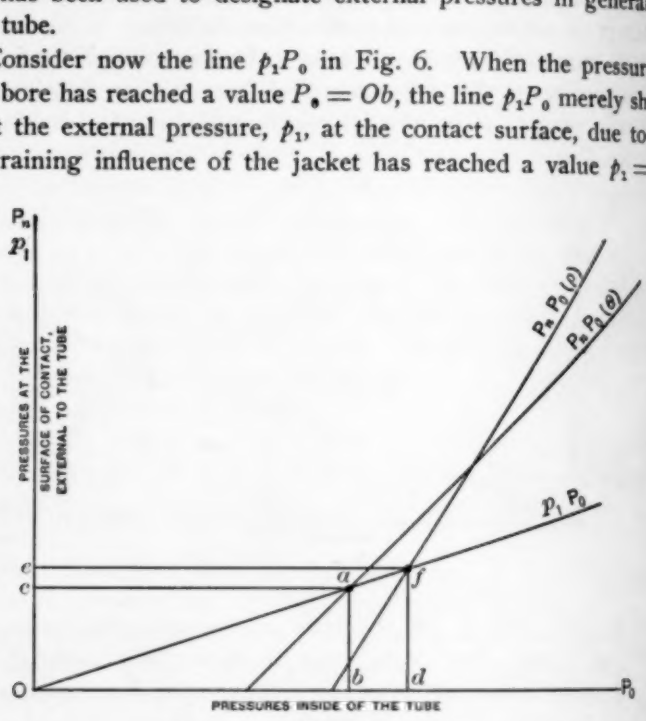


FIG. 6.

But, at a the line p_1P_0 cuts the line $P_nP_0(\theta)$. This last line is that for any point of which its coordinates represent a combination of internal and external pressure which will just bring the inner surface of the tube to its elastic limit of circumferential strain, so, the coordinates of the point in which the line p_1P_0 cuts $P_nP_0(\theta)$ will give that value of P_0 beyond which we cannot increase P_0 without overstraining the inner surface of the tube circumferentially, for which value of $P_0 = Ob$, we have $P_n = p_1 = ba$.

Similarly where p_1P_0 cuts $P_nP_0(\rho)$ in f will give a value of

$P_0 = Od$ beyond which P_0 may not be increased without overstraining the tube radially.

As we cannot allow our cylinder as a gun tube to exceed the elastic limit of circumferential strain the strength of our compound cylinder gun, as limited by the tube, if everything else is favorable, is given by the value of $P_0 = Ob$.

The next question is this: Are other conditions favorable and can we adopt this value of $P_0 = Ob$ and, basing our powder charges on it, have the gun safe?

8. **Further Consideration of Pressure Developed at the Surface of Contact.—Limits Imposed by the Jacket.**—We cannot answer the preceding question without further considering the pressure at the surface of contact. This pressure while an external one for the tube is an internal one for the jacket. The pressure on the exterior of the jacket is the atmosphere and is considered as zero. We have, therefore, to consider the effect of p_1 as an internal pressure on the jacket.

As p_1 increases it may reach a value which will overstrain the jacket circumferentially before the bore is overstrained, in which case we may not exceed in the bore a value of P_0 which will just bring the inner surface of the jacket to its elastic limit of circumferential strain.

That value of p_1 which will just bring the inner surface of the jacket to its elastic limit of circumferential strain, which we designate by p_1 (max) is, see equation (1) p. 2,

$$p_1 \text{ (max)} = \frac{3\,(R_2^2 - R_1^2)\,\theta_1}{4R_2^2 + 2R_1^2} \qquad (10)$$

in which R_2 and R_1 are the radii of the jacket and θ_1 the elastic strength under tension of the material of which the jacket is made.

As this is the limiting value of the interior pressure of the jacket at the surface of contact, it is also the *practical* limit, for the gun, of the external pressure on the tube at the surface of contact and we can plot it on Fig. 6.

As it was desired to have Fig. 6 free from all lines not essential to the text up to that point, Fig. 6 is reproduced, as Fig. 7, with a change essential to consistency in notation. The P_n of the original simple cylinder was a general symbol expressing an external pressure on the tube. We have used p_1 to designate the external pressure arising from placing the jacket on the tube and

as this is so far the only external pressure considered as acting the symbol p_1 is substituted for P_n, as shown in Fig. 7.

Fig. 7 gives the following information: If the strength of the jacket limits the value of p_1 (max) to Oz, then P_0 cannot exceed a value $P_0 = om$ without overstraining the *jacket*, since by the line p_1P_0 when $P_0 = om$, $p_1 = um = Oz$ and any further increase of P_0 will make $p_1 > Oz$, although the tube will not, at its inner surface, be overstrained circumferentially until $P_0 = Ob$, or radially until $P_0 = od$, as determined by the intersection of p_1P_0 with $p_1P_0(\rho)$ and $p_1P_0(\theta)$.

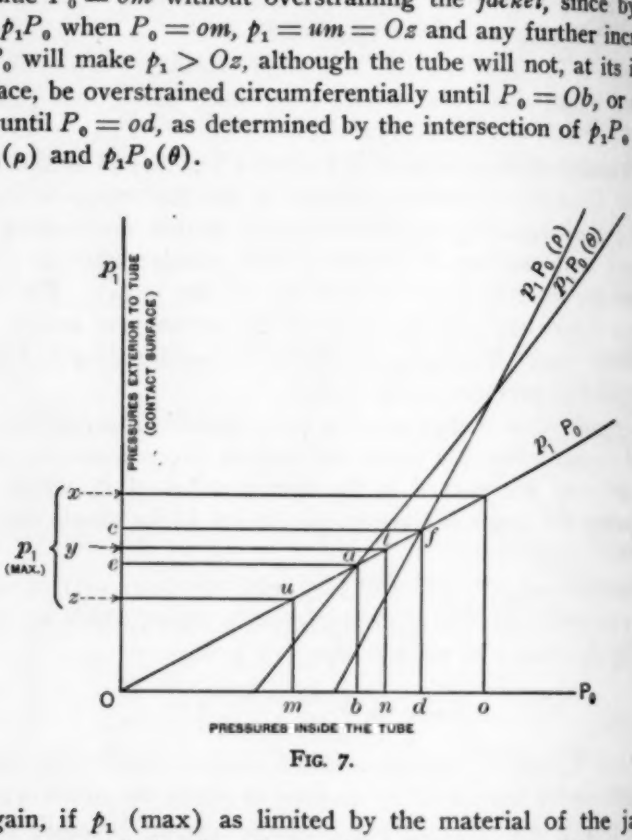


FIG. 7.

Again, if p_1 (max) as limited by the material of the jacket must not exceed Oy, then P_0 may have a value On without overstraining the jacket. But, by referring to the intersection of p_1P_0 with $p_1P_0(\theta)$ at a we see that P_0 must not be allowed to exceed $P_0 = Ob$ or the tube will be subjected to a pressure greater than that which will overstrain the bore circumferentially. We thus see there is for the condition we have just discussed a margin of safety in the jacket, as it will allow us to strain the tube to its elastic limit circumferentially by a value of $P_0 = Ob$ without being brought to its own limit of strain.

Again, we cannot carry P_0 to the value Od, which would bring the tube to its limit of radial strain, for in so doing p_1 would rise from a to f, and would cause $p_1 = fd = oc > Oy$, therefore Oy is the limit of p_1 allowed by the jacket and must not be exceeded.

Again, if the jacket permits a value of p_1 (max) $= Ox$ to be safely withstood by itself there would be required, by running from x to the line p_1P_0 and down to o a value of $P_0 = Oo$ tons to develop this value of p_1. A glance at the diagram, Fig. 7, will show that the combination of $P_0 = Oo$ and $p_1 = Ox$ is much in excess of the conditions represented at a and f, at which points the tube is at its limits of circumferential and radial strains. In consequence, the extra strength of the jacket which enables it to stand an internal pressure p_1 (max) $= Ox$ is useless since the tube is not strong enough to stand a value of P_0 which will produce p_1 (max) $= ox$.

9. **Two Cylinders Assembled with Shrinkage.**—Let us return now to the consideration of our original simple cylinder, taking it up at the point at which we were about to slip the jacket on it. Assume, also, that the jacket was too small to slip over the tube, and that we are compelled to heat it causing it to expand sufficiently to allow it to be slipped over the tube, and, that from this condition, while in place on the tube, it is allowed to cool.

As it cools it will attempt to contract, or shrink, and return to its original diameter. This effort to shrink will be resisted by the tube and a pressure will be set up at the surface of contact, which will increase with the further tendency of the jacket to cool, until the jacket and the tube have reached the normal temperature of the air. This pressure will then become stationary. We will designate it by $\overline{P}_1$.

10. **Effect of Pressure due to Shrinkage plus Pressure Developed at Contact Surface by the Pressure in the Bore.**—When this compound cylinder has cooled and is in equilibrium, the only pressure in existence is $\overline{P}_1$ and it is necessary to investigate the effect of this, when additional pressure p_1 at the contact-surface, due to P_0 in the bore, is brought into existence.

When P_0 acts, the pressure now at the contact surface is $\overline{P}_1 + p_1$. The sum of $\overline{P}_1 + p_1$ we shall denote by P_1, it being the resultant pressure at the contact-surface, due to shrinking on the jacket, and to the existence of a pressure in the bore.

In Fig. 8 plot the line p_1P_0, which shows the values of the pressure at the contact surface due to P_0, and on the same axes draw a line representing P_1 as produced by the amount of shrinkage (S_1) with which the cylinders have been assembled.

Now when P_0 has reached a value Oa, Fig. 8, p_1 has the value ab, and the total pressure at the surface of contact, P_1, is $(\bar{P}_1 + p_1) = ac + ab = ad = P_1$.

It is evident that we may obtain instantly the value of P_1 for any value of P_0 by simply drawing through x a line parallel to the line p_1P_0 and, that this line, for any given value of $\bar{P}_1$, will give coincident values of the total pressure at the surface of contact and pressures in the bore.

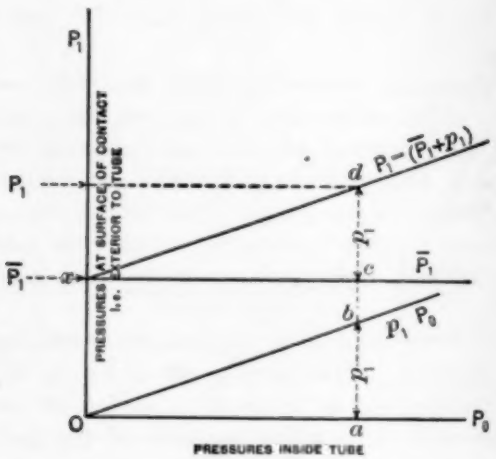


FIG. 8.

This diagram has another property, as follows: If the point d, Fig. 8, represents a condition due to certain coincident values of P_1 and P_0, and a line be drawn through d parallel to the line p_1P_0, the point at which that line cuts the vertical axis OP_1 will give ox, which is that value of $\bar{P}_1$ which we must have in order to produce the coincident values of P_1 and P_0 represented by d.

For example, if the coordinates of d, Fig. 8, were the values of P_1 and P_0 which would just bring the inner surface of the tube to its elastic limit of circumferential strain, and we draw a line through d parallel to p_1P_0 we can find what value of $\bar{P}_1$ will be necessary in order to have the inner surface of the tube reach

its elastic limit of circumferential strain under a pressure of $P_0 = Oa$ tons in the bore.

This knowledge is important because it will enable us directly and graphically to show what influence the *amount* of shrinkage has, and what amount is necessary to produce the desired value of $\bar{P}_1$.

11. **Shrinkage and $\bar{P}_1$.**—By shrinkage, is meant the difference, at the surfaces of contact, of the diameters of the jacket and tube before they are assembled.

The pressure $\bar{P}_1$ produced, at the surface of contact, by shrinking on the jacket is (see Alger, p. 44 (37))

$$\bar{P}_1 = \frac{E(R_1^2 - R_0^2)(R_2^2 - R_1^2)}{2R_1^2(R_2^2 - R_0^2)} \times \frac{S_1}{2R_1} \qquad (11)$$

in which E is the modules of elasticity and S_1 the shrinkage in

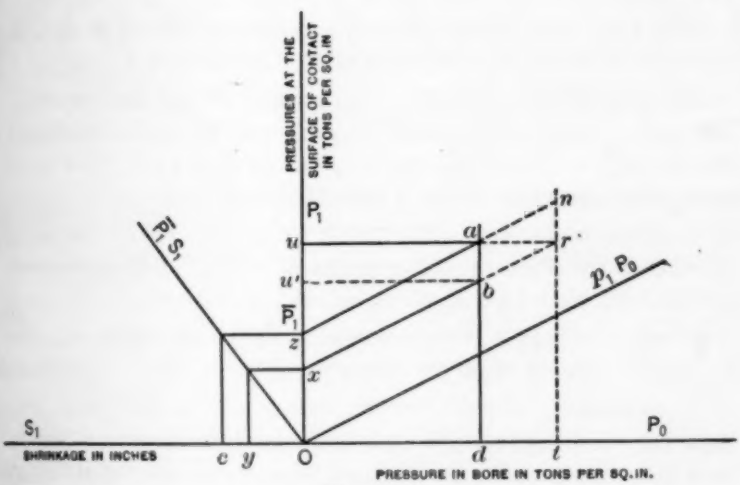


FIG. 9.

inches. For definite values of R_2, R_1, and R_0 the equation may be plotted as a straight line $\bar{P}_1 S_1$ and combined with Fig. 8, as shown in Fig. 9.

This diagram gives the following information: What shrinkage is necessary to produce at the surface of contact a pressure $P_1 = Ou$ tons, when $P_0 = Od$ tons, and what is the pressure due to this shrinkage when the gun is in a state of rest, *i. e.*, when the powder pressure has disappeared from the bore?

Solution.—At u, for $P_1 = Ou$ draw ua. At d, for $P_0 = Od$, erect a perpendicular cutting ua in the point a. Through a, draw a line parallel to p_1P_0 to z. Then $\overline{P}_1 = Oz$. Continuing from z, parallel to the horizontal axis, to the line $\overline{P}_1S_1$ and then drop to c. Oc is the shrinkage desired, and Oz is its corresponding pressure in the state of rest.

If for any reason we wish to maintain P_0 at its value Od tons but, because of the jacket cannot allow P_1 to exceed the value bd tons, what must be the value of P_1 and what shrinkage (S_1) must be used to accomplish this?

Solution.—From b draw a line parallel to p_1P_0, cutting the vertical axis at x. Then $\overline{P}_1 = Ox$ and its corresponding shrinkage is $S_1 = Oy$.

With a given shrinkage Oc and a maximum allowable value of $P_1 = Ou$, what is the maximum allowable value of P_0?

Solution.—From c, for $S_1 = Oc$, go to $\overline{P}_1S$ and then over to z. Through z, draw a line parallel to p_1P_0 until it cuts the horizontal line through u ($P_1 = Ou$) at the point a; drop to d. The maximum allowable value of P_0 is then $P_0 = Od$.

What is the effect on the pressure at rest ($\overline{P}_1$) if in assigning a shrinkage we adopt $S_1 = Oy$ instead of $S_1 = Oc$?

Solution.—From c and y, run up to $\overline{P}_1S_1$ and over to z and x. $\overline{P}_1$ will be reduced from Oz to Ox tons.

In the preceding case, if P_1 is to be kept constant at $P_1 = Ou$, how must the pressure in the bore be varied since the shrinkage has been reduced?

Solution.—Through u draw $P_1 = Ou$. Through x (the value of $\overline{P}_1$ corresponding to the reduced value of the shrinkage) draw a line parallel to p_1P_0 until it cuts $P_1 = Ou$ in the point r. From r drop to t. Therefore, with the reduced shrinkage P_0 must be increased from Od to Ot tons if P_1 is to remain constant, *i. e.*, if the jacket is to be worked to its limit.

If the final pressure at rest, *i. e.*, the pressure $\overline{P}_1$, due to the

shrinkage, be too great the tube may collapse through the effect of $\bar{P}_1$ acting alone after the powder pressure, P_0, has left the bore and no longer supports the tube.

Now take the following conditions for a problem: (1) P_0 must not exceed Od tons or the tube will be overstrained circumferentially while the powder pressure acts. (2) The pressure in action at the surface of contact, P_1, must not exceed the value $P_1 = Ou$ or the jacket will be overstrained circumferentially during the existence of the powder pressure in the bore. (3) The value of $\bar{P}_1$ must not exceed Ox or the tube will collapse when the powder pressure ceases to act and support the bore.

Under these conditions, what shrinkage may be used, and will the jacket be overstrained, or not, when the tube is just brought to its elastic limit of circumferential strain?

Solution.—At $P_0 = Od$ erect a perpendicular and through x draw a line parallel to p_1P_0 intersecting the perpendicular from d in the point b. Draw bu'. Then $P_1 = Ou' < P_1 = Ou$ and the jacket is not overstrained. The shrinkage corresponding to $\bar{P}_1 = Ox$ is $S_1 = Oy$.

Assume the following conditions for a problem: (1) The jacket will be brought to its limit of circumferential strain by a pressure $P_1 = Ou$. (2) The tube will be brought to its limit of circumferential strain by a pressure $P_0 = Ot$. (3) The tube at rest, *i. e.*, when not supported by a powder pressure in the bore cannot safely stand a pressure greater than $\bar{P}_1 = Oz$.

Problem.—Under these conditions, find what shrinkage must be used to bring the tube and jacket simultaneously to their elastic limits of circumferential strain, what final pressure at rest will be produced, and whether, or not, the tube can stand this pressure when the gun is at rest.

Solution.—Draw $P_1 = Ou$ and $P_0 = Ot$ intersecting in r. Through r draw rx parallel to p_1P_0. The tube will be safe at rest because $Ox < Oz$. The shrinkage corresponding to $\bar{P}_1 = Ox$ is $S_1 = Oy$.

---

12. Formulæ for a Gun of Two Cylinders.—The formulæ which follow are those for a gun consisting of a compound cylin-

der composed of two elementary cylinders assembled with shrinkage: (Alger, p. 43.)

$$P_1\,(\max) = \frac{3\,(R_2^2 - R_1^2)\,\theta_1}{4R_2^2 + 2R_1^2} \qquad (a)$$

$$P_0\,(\theta) = \frac{3\,(R_1^2 - R_0^2)\,\theta_0 + 6P_1R_1^2}{4R_1^2 + 2R_0^2} \qquad (b)$$

$$P_0\,(\rho) = \frac{3\,(R_1^2 - R_0^2)\,\rho_0 + 2P_1R_1^2}{4R_1^2 - 2R_0^2} \qquad (c)$$

$$\overline{P}_1\,(\max) = \frac{(R_1^2 - R_0^2)\,\rho_0}{2R_1^2} \qquad (d)$$

$$\dot{p}_1 = \frac{R_0^2\,(R_2^2 - R_1^2)\,P_0}{R_1^2\,(R_2^2 - R_0^2)} \qquad (e)$$

$$S_1 = \frac{4R_1^2\,(R_2^2 - R_0^2)\,\overline{P}_1}{E\,(R_1^2 - R_0^2)\,(R_2^2 - R_1^2)} \qquad (f)^* \qquad (12)$$

$P_1\,(\max)$ = That pressure at the surface of contact which, if exceeded, will overstrain the jacket circumferentially.

P_1 = The sum of all pressures at the surface of contact during the existence of a pressure P_0 in the bore, *i. e.*, while the gun is at the instant of firing. It is the sum of $\overline{P}_1$ and $\dot{p}_1$.

$\dot{p}_1$ = That portion of the total pressure at the surface of contact which is developed at that surface by the existence of P_0 in the bore.

$\overline{P}_1$ = The pressure at the contact-surface produced by shrinking on the jacket. When the gun is not in the act of firing $P_0 = O$, and $\overline{P}_1$ is the only pressure, an external one to the tube. If great enough it will overstrain the tube and tend to collapse it when P_0 ceases to act.

$\overline{P}_1\,(\max)$ = That value of $\overline{P}_1$ which cannot be exceeded without overstraining the inner surface of the tube when P_0 ceases to act.

S_1 = The shrinkage producing $\overline{P}_1$.

P_0 = Any pressure in the bore. It may be $P_0(\theta)$ or $P_0(\rho)$ in value.

* Derived from formula (37) p. 44, Alger's Elastic Strength of Guns.

$P_0(\theta)$ = That pressure in the bore which combined with P_1 at the surface of contact will just bring the inner surface of the tube to its elastic limit of circumferential strain.

$P_0(\rho)$ = That pressure in the bore which combined with P_1 at the surface of contact will just bring the inner surface of the tube to its elastic limit of radial strain.

$\theta_0 = \rho_0$ = Elastic strength of material of tube for extension and compression.

$\theta_1 = \rho_1$ = Same for the jacket.

13. **Computed Diagram for Two Cylinders.**—A complete diagram for a case of two cylinders is given in Fig. 10.

The data for this, taken from Alger, p. 43, are:

$R_0 = 3''$, $R_1 = 5''$, $R_2 = 8''$, $\theta_0 = \rho_0 = 18$ tons per sq. in., $\theta_1 = \rho_1 = 24$ tons per sq. in.

For use in plotting Fig. 10, the equations on p. 20 become:

$$\left.\begin{aligned} P_1\,(\max) &= 9.18 \text{ tons} \\ P_0(\theta) &= 7.31 + 1.272\,P_1 \\ P_0(\rho) &= 10.53 + 0.609\,P_1 \\ \bar{P}_1\,(\max) &= 5.76 \\ \bar{p}_1 &= 0.2554\,P_0 \\ \bar{P}_1 &= 295\,S_1 \end{aligned}\right\} (13)$$

14. **Discussion of Fig. 10.—Use of $P_0(\theta)$ and $P_0(\rho)$.**—From the formula P_1 (max) the jacket cannot stand a greater pressure at the surface of contact than P_1 (max) = 9.18 tons, with which value of P_1 a pressure $P_0 = 16.13$ tons will bring the tube to its elastic limit of radial strain, *i. e.*, $P_0(\rho) = 16.13$ tons; and, a pressure of $P_0 = 18.99$ tons will bring the inner surface of the tube to its elastic limit of circumferential strain, *i. e.*, $P_0(\theta) = 18.99$.

When P_1 (max) = 9.18 and $P_0(\rho) = 16.13$, $\bar{P}_1$ will have the value 5.06 tons which is less than $\bar{P}_1$ (max) = 5.76. The tube, therefore, will be safe at rest and the shrinkage which will just bring the jacket to its elastic limit of circumferential strain at the same time the tube reaches its elastic limit of radial strain, will be (for $\bar{P}_1 = 5.06$) $S_1 = .01715''$.

If with this shrinkage we increase P_0 from 16.13 to 18.99, P_1 will rise above the value 9.18, to *c*, Fig. 10, and the jacket will be overstrained.

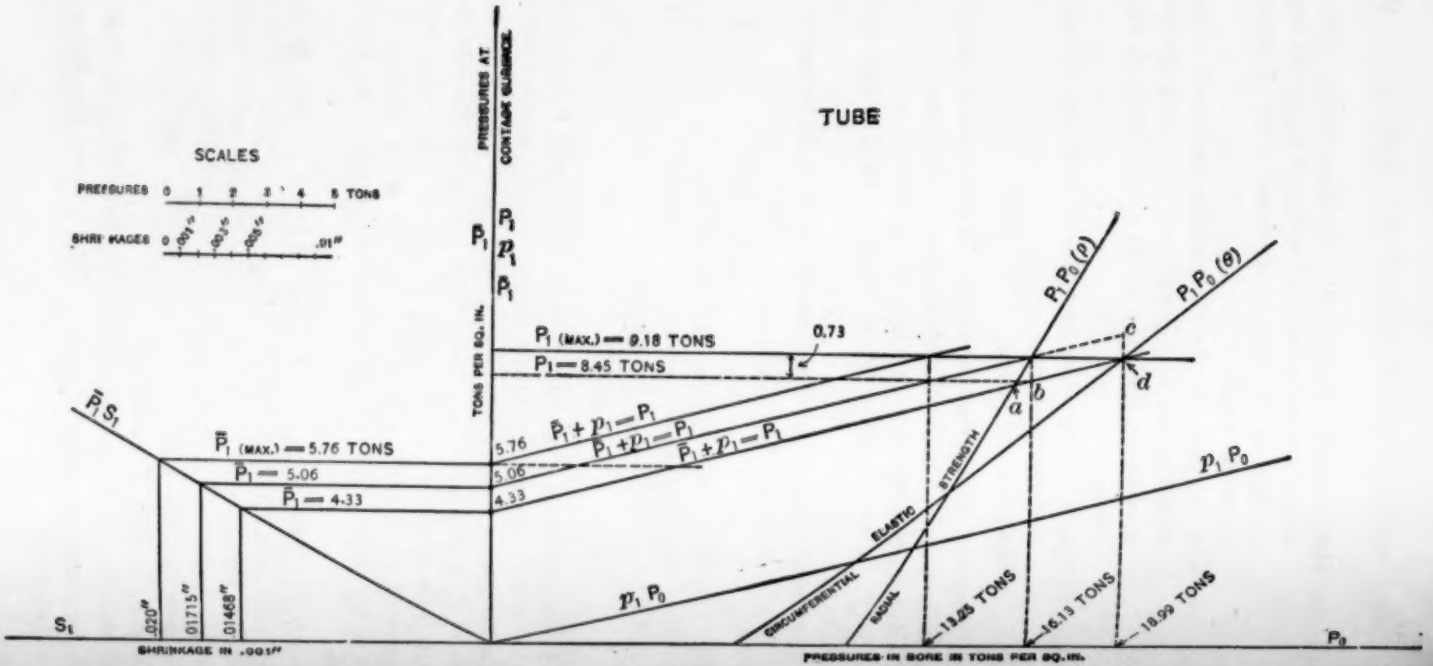

SCALES
PRESSURES 0 1 2 3 4 5 TONS
SHRINKAGES 0 .001" .002" .003" .01"
TUBE
PRESSURES AT CONTACT SURFACE
TONS PER SQ. IN.
P_1 (MAX.) = 9.18 TONS
P_1 = 8.45 TONS
0.73
$\bar{P}_1$ (MAX.) = 5.76 TONS
$\bar{P}_1$ = 5.06
$\bar{P}_1$ = 4.33
5.76
5.06
4.33
$\bar{P}_1 + p_1 = P_1$
$P_1 + p_1 = P_1$
$\bar{P}_1 + p_1 = P_1$
$\bar{P}_1 S_1$
$P_1 P_0$ (p)
$P_1 P_0$ (θ)
$p_1 P_0$
$p_1 P_0$
a
b
c
d
STRENGTH
ELASTIC
CIRCUMFERENTIAL
RADIAL
13.23 TONS
16.13 TONS
18.99 TONS
S_1
.000"
.01715"
.01468"
SHRINKAGE IN .001"
P_0
PRESSURES IN BORE IN TONS PER SQ. IN.

FIG. 10.

What shrinkage, now, will enable the jacket and the tube to be brought simultaneously to their elastic limits of circumferential strain? From d ($P_1 = P_1$ (max) $= 9.18$, $P_0 = P_0(\theta) = 18.99$) draw a line parallel to p_1P_0. This gives $\bar{P}_1 = 4.33$ and $S_1 = .01468$. The shrinkage is reduced and the pressure in the state of rest, $\bar{P}_1$, is also reduced from 5.06 to 4.33 tons.

As it is desirable to have as small pressures at rest as is consistent with developing the greatest possible strength of the gun, let us see what will be the effect of regulating the shrinkages by using $P_0(\theta)$ and using $P_0(\rho)$ for the limit beyond which we may not carry the pressure in the bore.

Refer to Fig. 10. Starting now from $\bar{P}_1 = 4.33$ ($S_1 = .01468''$ corresponding to $P_0\theta = 18.99$) the line of P_1 rises to $b = 8.45$ tons when $P_0(\rho) = 16.13$ tons. According to our diagram this line cuts the $P_1P_0(\rho)$ line at a, and if we proceed to b will slightly overstrain the tube's inner surface by radial compression if with $P_1 = 4.33$ we carry the pressure in the bore to the value 16.13 tons.

It is usually considered that this may be done with safety since the value of ρ_0 used in the formula is the value given by a free test of the specimen and not from a test of a specimen supported as by a jacket.

The practice in the army and navy is, when $P_0(\theta) > P_0(\rho)$ calculate shrinkages with it but limit powder pressures by $P_0(\rho)$. If $P_0\theta < P_0(\rho)$, then $P(\theta)$ must be used to determine both shrinkage and powder pressure.

Referring again to Fig. 10, and considering it without reference to the immediately preceding remarks, we see that our tube in the state of rest will stand a maximum pressure from shrinkage of $\bar{P}_1$ (max) $= 5.76$ tons.

What will be the effect of adopting this shrinkage? The diagram shows that if we start with $\bar{P}_1 = 5.76$ its maximum allowable value, P_1 will reach its limiting value of 9.18 tons when $P_0 = 13.25$ tons. In other words, by adopting this shrinkage the jacket will be overstrained long before the tube, and the full strength of the compound cylinders cannot be utilized in firing, while the tube in the state of rest will be subjected to the maximum pressure due to shrinkage that it can stand without being overstrained.

The diagram thus shows at a glance the effect of adopting any

shrinkage intermediate to those commented upon in this text, or the effect of the variation of any element for the state of action or rest, and the limiting value of the element considered for these states. The diagram is easily applied to the case of three cylinders.

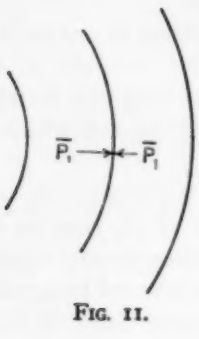


FIG. 11.

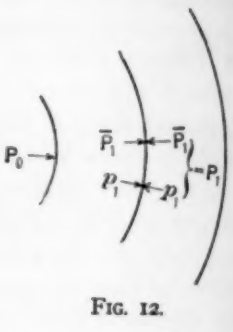


FIG. 12.

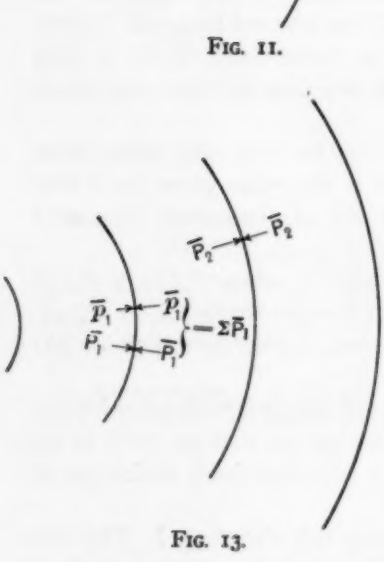


FIG. 13.

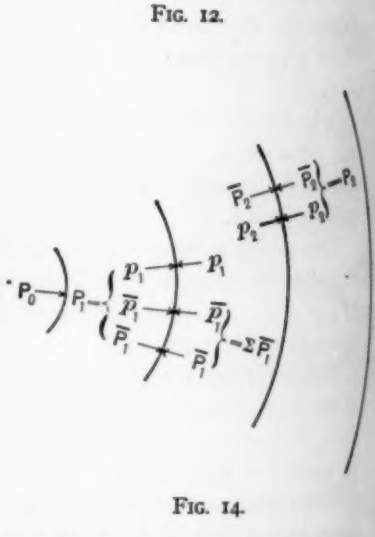


FIG. 14.

15. The Diagram for Three Cylinders.—Before explaining the construction of the diagram for the case of three cylinders it is necessary to discuss the effect of superimposing the third cylinder upon the two already assembled.

In the state of rest our compound cylinder composed of two simple cylinders assembled with shrinkage is subjected to but one pressure $\overline{P}_1$ existing at the surface of contact due to the shrinkage S_1 (see Fig. 11).

In the state of action there exists P_0 in the bore, its resultant p_1 at the contact surface in addition to $\bar{P}_1$ already existing at that surface (see Fig. 12).

Now take the compound cylinder in the state represented by Fig. 11 and shrink on it a third cylinder, termed a hoop, with a shrinkage of S_2 inches.

The surface at which this third cylinder clasps the jacket is called the second contact surface and the pressure at this surface due to the shrinkage S_2 with which it is assembled we will designate by $\bar{P}_2$. $\bar{P}_2$ is in every respect similar to $\bar{P}_1$ as discussed in the case of two cylinders, and is governed by the same laws.

In future, a quantity referring to pressures or shrinkages at the second contact surface are denoted by the subscript $_2$, and those for the first contact surface by the subscript $_1$.

When $\bar{P}_2$ is brought into existence by shrinking the hoop on the already assembled jacket and tube, a pressure due to $\bar{P}_2$ is transmitted through the jacket from the second to the first contact surface. This fraction of $\bar{P}_2$, designated by $\bar{p}_1$, will exist at the first contact surface in addition and coincident with the pressure, $\bar{P}_1$, already there due to shrinking the jacket on the tube.

The three cylinders assembled with shrinkage will, in the state of rest, be subjected to pressures as indicated in Fig. 13.

Starting with the conditions of Fig. 13, let a powder pressure P_0 be developed in the bore. P_0 produces at the first contact surface a pressure we will designate by p_1 and p_1 produces at the second contact surface a pressure p_2, both p_1 and p_2 existing at their respective contact surfaces in addition to the pressures already there due to the shrinkages.

The complete set of pressures for the three cylinders in the state of action is indicated in Fig. 14.

16. Notation in Formulæ for Three Cylinders.—

E . . . . . Modulus of elasticity.

R_0, R_1, R_2, R_3 . . . Radii of surfaces of cylinders.

$\theta_0, \theta_1, \theta_2$ . . . . . Elastic limits of metal of tube, hoop, and jacket under tension.

ρ_0, ρ_1, ρ_2 . . . . . Elastic limits of same under compression.

P_0, P_1, P_2 . . . . Total pressures; in the bore P_0; at the first contact surface, P_1; and at the second contact surface, P_2, with the system in *action*. Their maximum values which can be supported without exceeding the elastic limits, to be designated by the suffix (θ) or (ρ) accordingly as they represent pressures producing circumferential or radial strains.

$\overline{P}_1$, $\overline{P}_2$ . . . . . Pressures, $\overline{P}_1$ at first contact-surface due to shrinking jacket on tube; and, $\overline{P}_2$ at second contact surface due to shrinking hoop on jacket.

$\bar{p}_1$ . . . . . Pressure at first contact-surface due to $\bar{P}_2$ at second contact-surface.

$\Sigma\overline{P}_1$ . . . . . Sum of all pressures, for the state of rest, at the first contact surface.

$$\Sigma\overline{P}_1 = \overline{P}_1 + \bar{p}_1.$$

p_1 . . . . . With the system in action, p_1 is the pressure at first contact surface due to P_0 in bore.

p_2 . . . . . With the system in action, p_2 is the pressure at second contact surface due to p_1 at the first contact surface.

S_1, S_2 . . . . . Shrinkages, in inches, producing $\overline{P}_1$ and $\overline{P}_2$.

$P_1(\max)$, $P_2(\max)$ Values of P_1 and P_2 which cannot be exceeded without overstraining the jacket (P_1 max), or hoop (P_2 max), hence the limiting values of P_1 and P_2 for the state of action.

$\Sigma P_1(\max)$ . . . . That value of $\Sigma\overline{P}_1$ which cannot be exceeded without overstraining the tube by compression of the bore when the tube is not supported by powder pressure, hence the limiting value of $\Sigma\overline{P}_1$ for the state of rest.*

* $\Sigma\overline{P}_1$ in these notes is that designated by $\overline{P}_1$ in Alger. The symbol $\Sigma\bar{P}$ is used here because it is desired to indicate that the total pressure at the first contact surface is composed of two elements due to separate shrinkages.

* FORMULÆ (14) FOR THREE CYLINDERS ASSEMBLED WITH SHRINKAGE

I.	II.	III.	IV.	V.
Part affected.	Character of pressure.	Formula.	Plots the Line.	Relationship shown by the line of Col. IV.
Hoop.	Internal.	$P_2(\theta)=\frac{3(R_3^2-R_2^2)\theta_2}{4R_3^2+2R_2^2}$ (a)	P_2 (max)	Value above which P_2 cannot rise without overstraining the hoop circumferentially.
Jacket.	External.	P_2	....	General symbol for pressure external to jacket.
		$\bar{P}_2=\frac{E(R_2^2-R_0^2)(R_3^2-R_2^2)}{4R_2^2(R_3^2-R_0^2)}\cdot S_2$ (b)	$\bar{P}_2\,S_2$	Shows the pressure produced at second contact surface by assembling the hoop with any shrinkage S_2.
		$p_2=\frac{R_1^2(R_3^2-R_2^2)}{R_2^2(R_3^2-R_1^2)}\cdot p_1$ (c)	$p_2\,p_1$	Shows the pressure produced at the second contact surface (in addition to that already existing there due to shrinking on hoop), by any pressure p_1 acting at the interior surface of the jacket. The line p_2p_1 is identical in character for the jacket with the line p_1P_0 for the tube. See Figs. 5, 6 and 8 and discussion thereupon, all of which applies in principle to the line p_2P_1.
	Internal.	$P_1(\theta)=\frac{3(R_2^2-R_1^2)\theta_1+6R_2^2P_2}{4R_2^2+2R_1^2}$ (d)	$P_2P_1(\theta)$	The coordinates of any point on this line show what coincident values of an external pressure P_2 with an internal pressure P_1 will just bring the inner surface of the jacket to its elastic limit of circumferential strain.
		$P_1(\rho)=\frac{3(R_2^2-R_1^2)\rho_1+2R_2^2P_2}{4R_2^2-2R_1^2}$ (e)	$P_2P_1(\rho)$	Similar to the above for the elastic limit of radial strain.

*Taken principally from Alger's Elastic Strength of Guns, but also from Notes on the Construction of Ordnance, Nos. 35 and 59, by Major Birnie, U. S. A. The gun is considered as a compound cylinder with free ends.

FORMULÆ (14) FOR THREE CYLINDERS ASSEMBLED WITH SHRINKAGE.—Continued.

I. Part affected.	II. Character of pressure	III. Formula.	IV. Plots the Line.	V. Relationship shown by the line of Col. IV.
JACKET, Cont'd.	Internal, Cont'd.	$\bar{P}_1 = \frac{E(R_1^2 - R_0^2)(R_2^2 - R_1^2)S_1}{4R_1^2(R_2^2 - R_0^2)}$ (f)	$\bar{P}_1$ S_1	Shows the pressure produced at the first contact surface by assembling the jacket with an shrinkage S_1. This pressure $\bar{P}_1$ (in these notes) does not include that pressure at first contact surface produced by shrinking on the hoop. $\bar{P}_1$ refers to the jacket alone and exists simultaneously with but distinct from $\bar{p}_1$.
		$\bar{p}_1 = \frac{R_2^2(R_1^2 - R_0^2)}{R_1^2(R_2^2 - R_0^2)} \cdot \bar{P}_2$ (g)	$\bar{p}_1$ $\bar{P}_2$	Indicates what fraction of $\bar{P}_2$ is included, at first contact surface, in the value of $\Sigma \bar{P}_1$. It gives the element of pressure at the first contact surface due to $\bar{P}_2$ at the second surface. It is used to graphically separate $\Sigma \bar{P}_1$ into $\bar{p}_1$ and $\bar{P}_1$.
		$p_1 = \frac{R_0^2(R_1^2 - R_1^2)}{R_1^2(R_2^2 - R_0^2)} \cdot P_0$ (h)	p_1 P_0	Shows the pressure produced at the first contact surface by P_0 in the bore. This pressure, p_1, is in addition to any pressure due to shrinkage already existing at the first contact surface. See Figs. 5, 6 and 8 and discussion thereof.
TUBE.	External.	P_1 (i)	....	General symbol for total pressure at first contact surface for the state of action. It is therefore the sum of $\bar{p}_1 + \bar{P}_1$ at any instant.
		$\bar{P}_1$ (j)	$\bar{P}_1$ S_1	Same as (f) for jacket. It is an internal pressure for the jacket but external to tube.
		$\Sigma \bar{P}_1 = \bar{P}_1 + \bar{p}_1$ (k)	....	Sum of all pressures at first contact surface in the state of rest.

FORMULÆ (14) FOR THREE CYLINDERS ASSEMBLED WITH SHRINKAGE.—Continued.

I.	II.	III.	IV.	V.
Part studied.	Character of pressure.	Formula.	Plots the Line.	Relationship shown by the line of Col. IV.
Tube, Cont'd.	External, Cont'd.	$\Sigma\bar{P}_1\,(\max)=\dfrac{(R_1^2-R_0^2)}{2R_1^2}\cdot\rho_0$ (*l*)	....	Maximum value of the pressures, due to collective shrinkages, which the tube can stand and not be over compressed when the powder pressure does not support the bore.
		P_1 (*m*)	$p_1\,P_0$	Same as (λ) for the jacket. It is internal for jacket, external to bore.
		P_0 (*n*)	....	General symbol for pressure in the bore, may have $P_0\,(\theta)$ or $P_0\,(\rho)$ as a particular value.
		$P_0\,(\theta)=\dfrac{3\,(R_1^2-R_0^2)\,\theta_0+6\,R_1^2\,P_1}{4\,R_1^2+2\,R_0^2}$ (*o*)	$P_1\,P_0\,(\theta)$	The coordinates of any point on this line show what coincident values of a pressure in the bore, P_0, combined with an external pressure P_1 will just bring the inner surface of the bore to its elastic limit of circumferential strain.
		$P_0\,(\rho)=\dfrac{3\,(R_1^2-R_0^2)\,\rho_0+2\,R_1^2\,P_1}{4\,R_1^2-2\,R_0^2}$ (*q*)	$P_1\,P_0\,(\rho)$	Similar to the above for the elastic limit of radial strain.

17. Principle of the Diagram for Three Cylinders.

FIG. 15.

Axes are drawn as indicated in Fig. 15, in the upper right hand quadrant, of which is constructed, for the tube considered as a cylinder subjected to internal and external pressure, a diagram similar to Fig. 1. In the second quadrant is constructed a similar diagram for the jacket considered as a tube subjected to internal and external pressures.

For the hoop, only one calculation is necessary, that, $P_2(\theta)$ beyond which the internal pressure of the hoop must not be carried without exceeding the elastic limit of circumferential strain.

For the sake of clearness, the line $\bar{P}_1 S_1$ of Fig. 10 is in Fig. 15 plotted in the first quadrant, while the corresponding line $\bar{P}_2 S_2$ for the jacket is dropped to the third quadrant.

For any assumed condition of the hoop, jacket, or tube, coincident relationship of the other parts may be traced through the diagram, and effect of modifying one element noted in the others.

18. The first lines drawn are $P_1P_0(\theta)$, $P_1P_0(\rho)$, $P_2P_1(\theta)$, $P_2P_1(\rho)$, p_1P_0, and p_2p_1, as given by their equations (14). Read Fig. 16 in connection with what follows.

The next step is to assume that the system is in action and that the hoop has been brought to its allowable elastic limit as given. The pressure which will do this is $P_2(\theta)$.

Next, with $P_2(\theta)$, now as an external pressure to the jacket, we must find from the line $P_2P_1(\theta)$ or $P_2P_1(\rho)$ what internal pressure we may allow for the jacket. This pressure is usually taken as the least given by either of the lines $P_2P_1(\theta)$ or $P_2P_1(\rho)$. Having determined this value of P_1 we must next find what pressure P_0 in the bore must be used to develop this value of P_1. This is determined by the points in which the horizontal line drawn from the above determined value of P_1 cuts the lines $P_1P_0(\theta)$ and $P_1P_0(\rho)$.

There will thus be two values for P_0 which will produce that value of P_1 which in turn produces that value of P_2 which will bring both hoop and jacket simultaneously to their elastic limit of circumferential strain.

One, $P_0(\rho)$, of the two values of P_0, acting with P_1 will bring the inner surface of the tube to its elastic limit of radial strain.

The other value of P_0, $P_0(\theta)$, acting with P_1 will bring the inner surface of the tube to its elastic limit of circumferential strain.

*If $P_0(\theta)$ as determined above be less than $P_0(\rho)$ then the latter will be disregarded, for we may not admit in any case, that the elastic limit of circumferential extension can be safely exceeded for any part of the system.

If, however, $P_0(\theta)$ as determined above be greater than $P_0(\rho)$, there will be two possible values of P_0, which will lead to different results as one or the other is adopted.

Simply stated, when $P_0(\theta) > P_0(\rho)$, it will require larger shrinkages to produce the required value of P_1 with a value of $P_0 = P_0(\rho)$, than it would with a value of $P_0 = P_0(\theta)$.

As reduced shrinkages produce less strain for the state of rest, and as this is desirable, let us base the shrinkages, with which the cylinders are assembled, upon $P_0 = P_0(\theta)$.

Having now decided upon P_2, P_1, and P_0, assume that the pressure in the bore disappears and that the gun gradually reaches a state of rest.

P_0 will become 0; P_1 becomes $\Sigma\bar{P}_1 = (\bar{P}_1 + \bar{p}_1)$, and P_2 become $\bar{P}_2$. P_1 will fall along a line parallel to the line p_1P_0 and P_2 will

*Birnie, Ord. Notes U. S. A. No. 50.

fall parallel to the line p_2p_1, stopping at that value of P_2 as determined by $\Sigma\bar{P}_1$ as an internal pressure on the jacket.

From the above value of $\bar{P}_2$ and the line $\bar{P}_2S_2$, we get S_2; and from the same value of $\bar{P}_2$ and the line $\bar{p}_1\bar{P}_2$ we get $\bar{p}_1$. Deducting $\bar{p}_1$ from $\Sigma\bar{P}_1$ we get $\bar{P}_1$, and with this and the line $\bar{P}_1S_1$, we get S_1.

If in the state of rest $\Sigma\bar{P}_1$ be equal to or less than $\Sigma\bar{P}_1$ (max) the tube is not overcompressed at the bore and the gun is safe. If, however, $\Sigma\bar{P}_1$ be greater than $\Sigma\bar{P}_1$ (max) we must readjust the values of S_1 and S_2 so as to make the bore safe from overcompression for the state of rest, or better, select an allowable value of $\Sigma\bar{P}_1$ and from this determine S_1, S_2, P_0, etc.

Each one of the foregoing steps may be performed graphically and is indicated in Fig. 16, in sequence, by the lettering *a*, *b*, *c*, *d*, etc.

In this figure it will be seen that pressures $P_0 = Oc' = P_0(\theta)$, $P_1 = Ob' = P_1(\theta)$, and $P_2 = Oa = P_2(\theta)$ will bring the tube jacket and hoop, simultaneously to their elastic limits of circumferential strain. Also, that the shrinkages based on these values are $S_2 = Og'$ and $S_1 = Oi$. Also, that the pressure at rest at the second contact surface is $\bar{P}_2 = de$ and $\Sigma\bar{P}_1 = Od$. By drawing a line from *e* parallel to $\bar{P}_2p_1$, we graphically deduct $\bar{p}_1 = df$ from $\Sigma\bar{P}_1$ leaving $\bar{P}_1 = Of$, with which value of $\bar{P}_1$ we use the line $\bar{P}_1S_1$ to find $S_1 = Oi$, as stated above.

A Note on the Line p_2p_1.—This line, to be strictly correct, should be drawn from the point *d*, Fig. 16, as P_0, p_1, and p_2 should simultaneously become *O* for $P_0 = O$. But as this would necessitate a new line every time the point *d* shifted, and as the real use of the line is merely to express the degree of the change in p_2 for a change in p_1, it is sufficient to draw it once for all through the origin and use it in the sense of a direction cosine.

19. Fig. 17 gives the following information, as shown by the construction:

If, with $P_2(\theta) = 4.389$, we use $P_1(\rho)$, the corresponding value of $P_0(\theta)$ will be 25.04 tons, its maximum possible strength. With the same value of $P_2(\theta)$ and restricting ourselves to $P_1(\theta)$ for reasons given in the previous text, we find that $P_2 = 4.389$, $P_1 = 13.445$, and $P_0 = 23.33$ will just bring the three cylinders simultaneously to their elastic limit of circumferential strain.

With these values of P_2, P_1, and P_0 the pressures at rest are $\Sigma\bar{P}_1 = 4.785$, $\bar{P}_2 = 2.70$, and $\bar{P}_1$ slightly less than 3.0 tons. The corresponding shrinkages required are $S_2 = .0210$ and $S_1 = .0118$.

If for practical purposes we adopt the values to the nearest one-thousandth of an inch thus retaining $S_2 = .021$ and making $S_1 = .012$ $\bar{P}_1$ becomes 3.0 tons, $\Sigma\bar{P}_1$ 4.85 tons, and $P_0(\theta)$ becomes 23.4 tons.

If we now call $P_0(\rho)$ our safe limit of pressure in the bore $P_0(\rho) = 18.14$, and when this pressure is exerted in the bore the

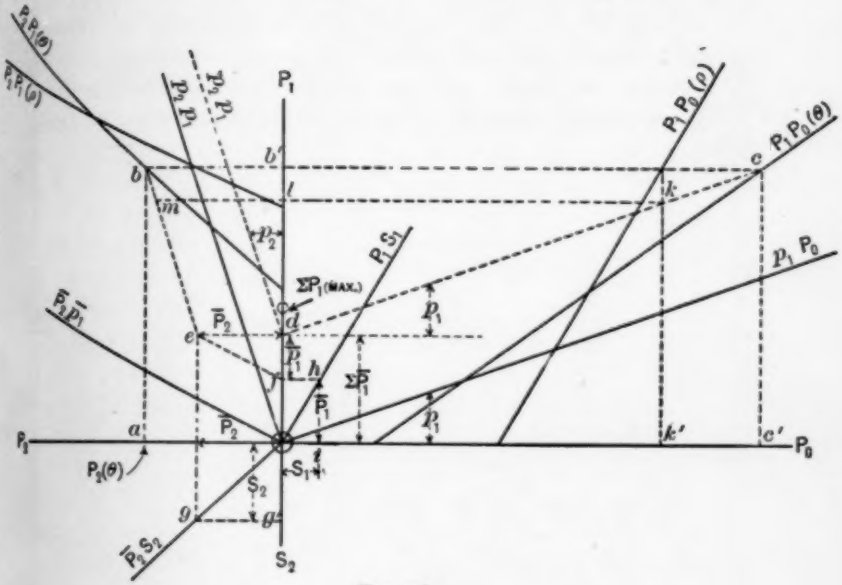


FIG. 16.

pressures at the contact surfaces rise to 11.6 tons in the jacket and 4.0 tons in the hoop, returning at rest to 4.85 tons and 2.70 tons, respectively.

If it became necessary in assigning shrinkages to adopt $S_1 = .008''$ and $S_2 = .016''$, the corresponding value of $P_0(\theta)$, P_1 and P_2 would be 20¼, 10.94, and 3.5 tons, respectively. The pressures at rest would be $\bar{P}_1 = 1.98$, $\bar{P}_2 = 2.06$, and $\Sigma\bar{P}_1 = 3.38$.

If we limit the pressure in the bore by the value of $P_0(\rho)$ corresponding to $P_0(\theta) = 20¼$, we will have the safe internal pressure in the bore $= P_0(\rho) = 17$ tons $(\pm)$.

If instead of adopting the values just considered we had assigned $S_1 = .015$, and $S_2 = .025''$, the construction clearly shows that in action a pressure in the bore of 16 tons would quickly bring the hoop to its elastic limit of circumferential strain before the elastic limit of either jacket or tube had been reached.

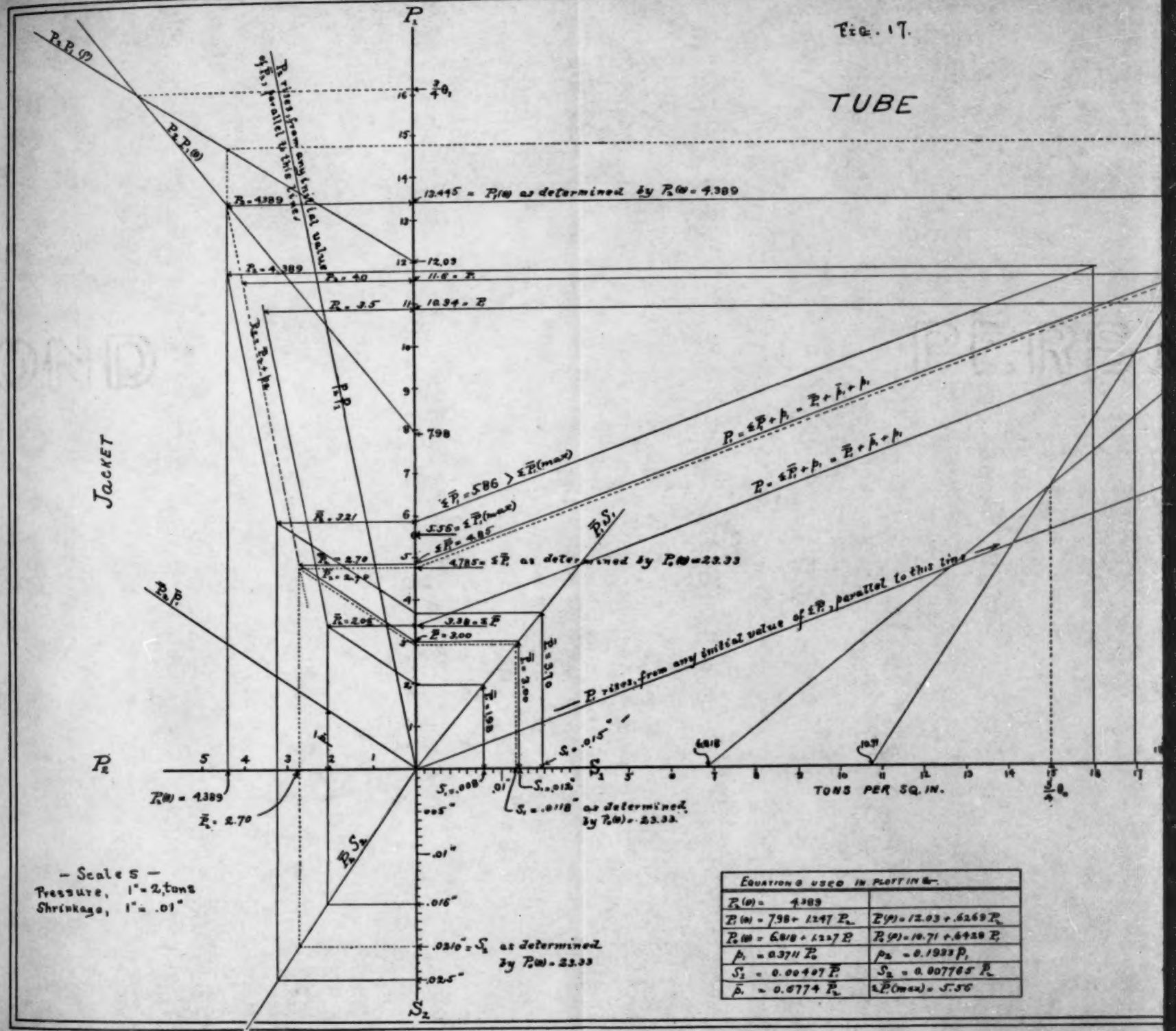
It shows also that these shrinkages are really unallowable because $\Sigma\overline{P}_1$, due to them, is greater than $\Sigma\overline{P}_1$ (max), and the bore is overcompressed in the state of rest.

The effect, of varying one or both shrinkages, on the working of the gun is clearly indicated by the figure.

It is believed that the diagram, which is original, will assist the beginner to better understand the discussions of relations of the elements of elastic strength which, in text-books are frequently confusing and often apparently contradictory in conclusions.

Fig. 17.

TUBE

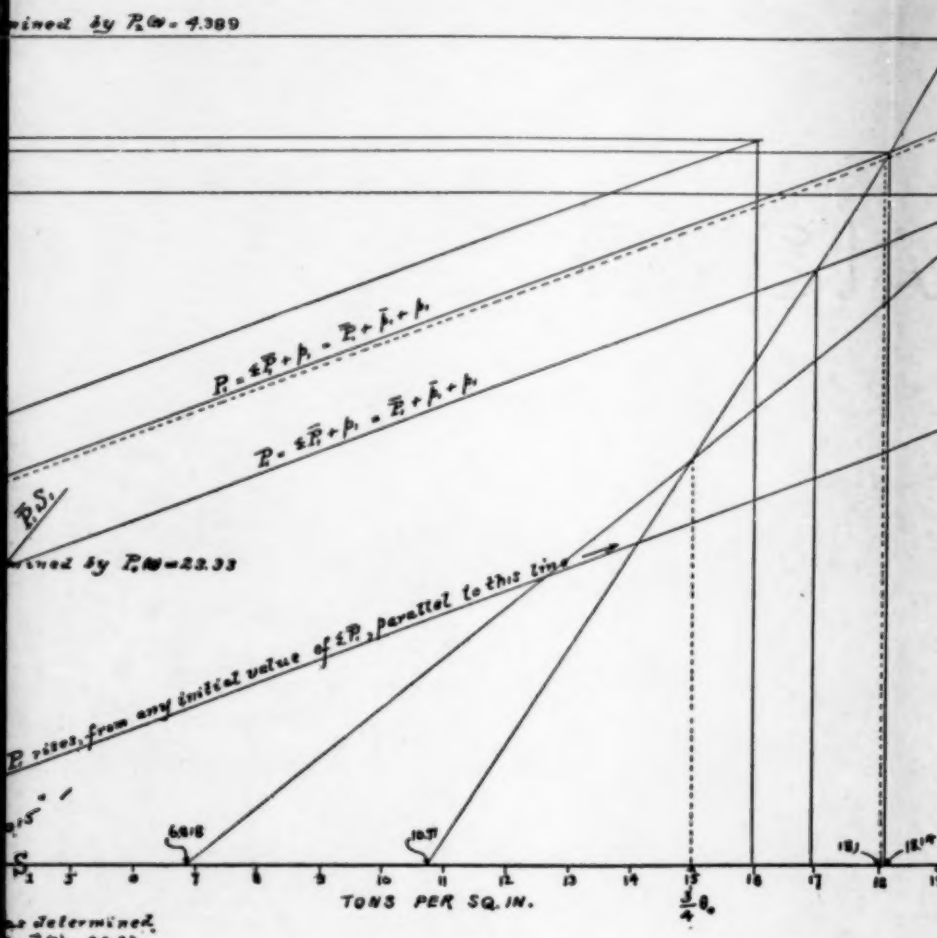


— Scale s —
Pressure, 1" = 2 tons
Shrinkage, 1" = .01"

Equations used in plotting.	
$P_2(0) = 4.389$	
$P_1(0) = 7.98 + 1.247\ P_2$	$\bar{P}(9) = 12.03 + .6269\ P_2$
$P_2(0) = 6.818 + 1.227\ P_1$	$P_2(9) = 10.71 + .6429\ P_2$
$\bar{P}_1 = 0.3711\ P_2$	$p_2 = 0.1939\ p_1$
$S_1 = 0.00497\ P_1$	$S_2 = 0.007765\ P_2$
$\bar{p}_1 = 0.6774\ P_2$	$\Sigma\bar{P}(max) = 5.56$

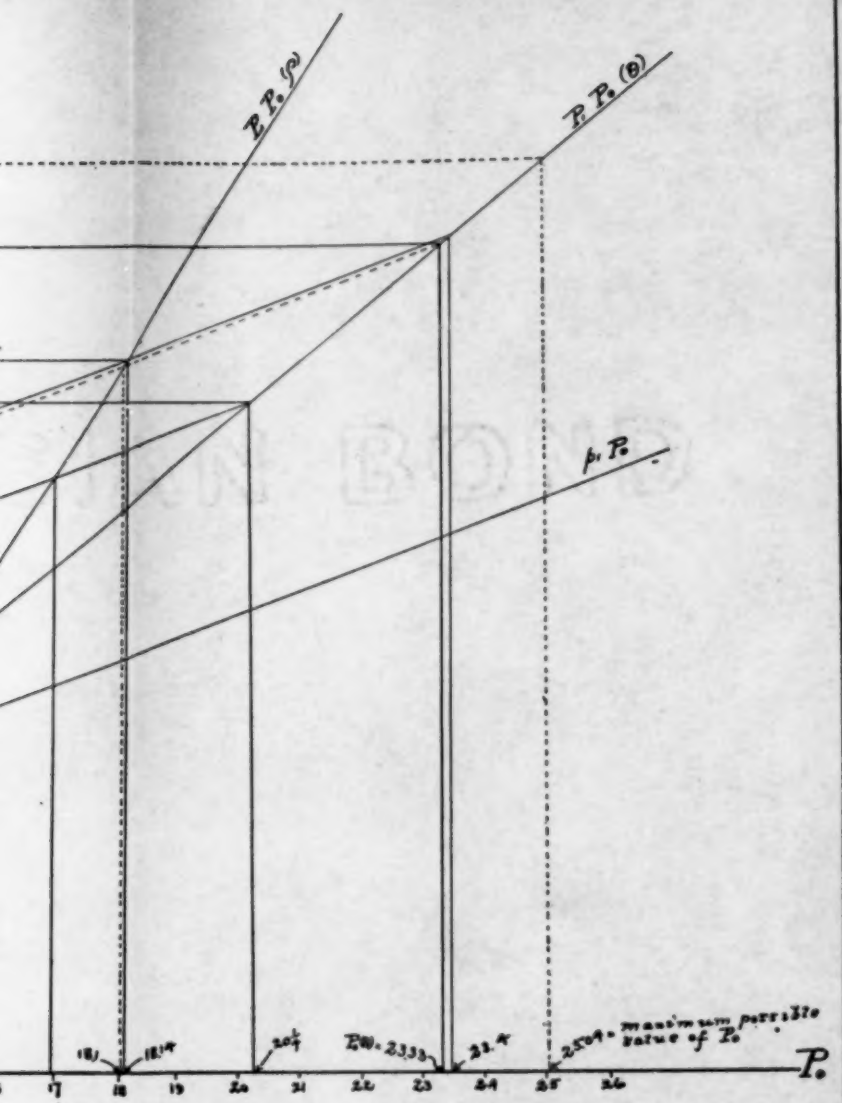
Fig. 17.

TUBE


mined by $P_2(0) = 4.389$
$P_1 = \Sigma P + \beta_1 = \bar{P}_1 + \bar{\beta}_1 + \beta_1$
$P = \Sigma P_1 + \beta_1 = \bar{P}_1 + \bar{\beta}_1 + \beta_1$
$P_1 S_1$
mined by $P_1(0) = 23.33$
P_1 ratios from any initial value of ΣP_1 parallel to this line
6.818
10.77
TONS PER SQ. IN.
$\frac{3}{4} \theta_0$

mined determined by $P_1(0) = 23.33$.

Equations used in plotting.	
$P_2(0) = 4.389$	
$P_1(0) = 7.98 + .1247\ P_2$	$P(P) = 12.03 + .6269\ P_2$
$P_2(0) = 6.818 + .1217\ P_1$	$P_2(P) = 10.71 + .6429\ P_1$
$\beta_1 = 0.3711\ P_2$	$\beta_2 = 0.1933\ P_1$
$S_1 = 0.00407\ P_1$	$S_2 = 0.007785\ P_2$
$\bar{\beta}_1 = 0.6774\ P_2$	$\Sigma P(max) = 5.56$



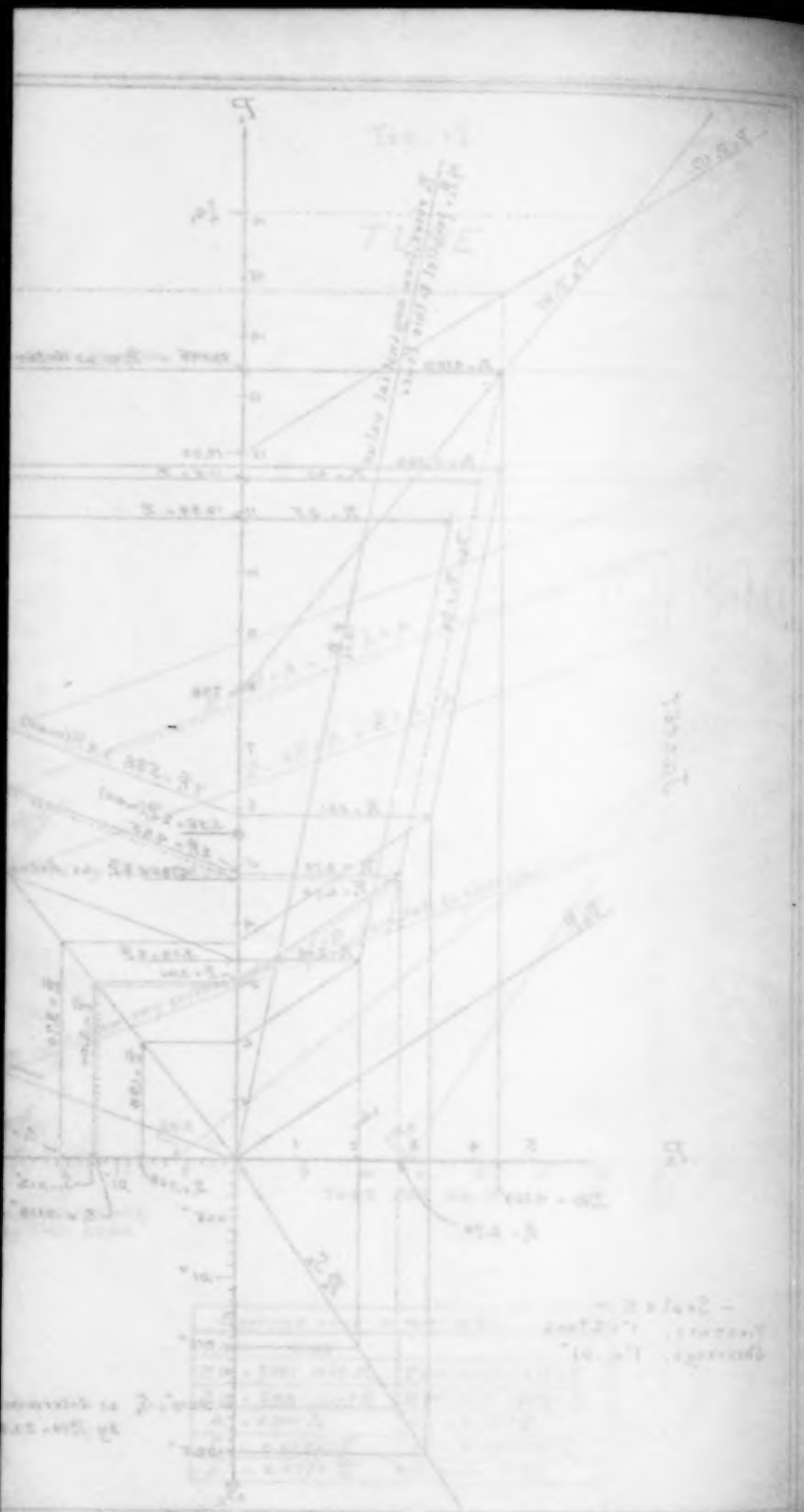
GRAPHIC REPRESENTATION
OF THE
RELATION of SHRINKAGE and PRESSURES
IN BUILT-UP GUNS
For the States of ACTION and REST.

Data: 5-inch B.L.R. mark V, Section I.

$R_0 = 3.50$, $R_1 = 5.25$, $R_2 = 8.25$, $R_3 = 10.25$, inches

$\theta_0 - P_0 = 20.0$, $\theta_1 - P_1 = 21.5$, $\theta_2 - P_2 = 22.0$, tons

Fr. Nalton



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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

EARLY NAVAL ADMINISTRATION UNDER THE CONSTITUTION.[1]

By CHARLES OSCAR PAULLIN.

THE NAVY UNDER THE DEPARTMENT OF WAR, 1789-1798.

The Constitution of the United States, which went into effect in 1789, contained several provisions in respect to a navy. It gave Congress power to "provide and maintain a navy," to make rules for the government and regulation of the naval forces, and to exercise exclusive legislation over all places purchased for dock-yards. It made the President "commander-in-chief of the navy," and it forbade the states to own ships of war in time of peace. The Constitution did not specifically establish the executive departments. It, nevertheless, implied that such departments were to be established, and that each of them was to have a "principal officer." Inasmuch as the framers of the Constitution were accustomed during the American Revolution to transact the naval business of the country by means of a naval department, distinct from the other executive departments, it is likely that those who thought upon the subject contemplated the organization of a naval department under the Constitution.

When, in 1789, the first executive departments were organized, the United States had no navy, and there was no pressing need for one. A naval department at this time would have been a piece of unnecessary machinery. However, in anticipation of the time when a navy should be established, it seemed wise to Congress that the control of the naval affairs should be definitely lodged in one of the executive departments. Congress, therefore, vested it in the secretary of war. This was a natural disposition, as the office of the secretary of war is analogous to that of the secretary of the navy. According to the act of August 7,

[1] Constitution of the United States, Art. I, Sec. 8, 10; Art. II, Sec. 2.

1789, establishing the Department of War, the Secretary of War was directed to perform and execute all duties relating to "military commissions, or to the land or naval forces, ships, or warlike stores of the United States, or to such other matters respecting the military or naval affairs, as the President of the United States shall assign to the said department."[2]

It was not until the beginning of Washington's second administration that an occasion arose, which led to the procuring of an armed fleet. The relations between the United States and the Barbary Powers had been more or less unsettled and unsatisfactory since 1783. These countries claimed the right to exact tribute from the United States, to disregard their treaties, to prey upon American commerce, and to demand a ransom for the American prisoners in their hands. It is noteworthy that in 1786, some months after the last vessel of the navy of the Revolution had been sold, a committee of the Congress of the Confederation favored the reestablishment of a navy in order to bring to terms these corsairs of the Mediterranean. It reported that "it is proper and expedient for the federal government to turn their earliest attention to the Marine Department, and that a committee be appointed to frame and report an ordinance for organizing the same."[3] Nothing came of this recommendation.

The difficulties with these corsairs may have led the Secretary of War in the fall of 1790 and again in the fall of 1791 to turn his attention towards procuring an armed fleet. In November, of the latter year, he submitted to a committee of the Senate several estimates, showing the cost of maintaining ships of different types. As early as the fall of 1790 the Secretary had obtained two estimates of the cost of building frigates, one from a naval constructor of Philadelphia, and the other from John Foster Williams, of Massachusetts, the well-known captain of the frigate *Protector*, the largest vessel in the Massachusetts navy of the Revolution. Williams's letter, dated Boston, October 30, 1790, is the first letter relating to naval affairs, as far as is known, that was received by the War Department. It read as follows:

"Agreeably to your request, I enclose you an estimate of a frigate of nine hundred tons, and believe it to be not far wide of what will be the real cost, but as the circumstances would not

[2] U. S. Statutes at Large, I, 50.

[3] Records and Papers of the Continental Congress, No. 25, II, 459.

admit of my being too open in my enquiries, it may vary a little. The cost of the guns and warlike stores you can form a better judgment of than myself. The timber, etc., should be cut in the fall of the year, as that would add much to its duration. Should any further inquiries be necessary, or any services that I can render be acceptable, shall be happy in being favored with your commands."[1]

The earliest attempts to procure some armed vessels for the purpose of sending them against the corsairs were unsuccessful. Late in 1793 the attempts were renewed. In December of that year, Washington brought the matter to the attention of Congress by laying before it a report of the Secretary of State on the measures which the United States had taken for the purpose "of obtaining a recognition of our treaty with Morocco and for the ransom of our citizens and the establishment of peace with Algiers."[2] The relations of the United States with the Barbary Powers, and especially with Algiers, were now thoroughly discussed in Congress, and it was finally decided to try the efficacy of an armed force. On March 27, 1794, a bill "to provide a Naval Armament," which had been passed by Congress, was signed by the President. Its purpose, according to its preamble, was to protect the commerce of the United States from the depredations of the Algerine corsairs.

The navy under the Constitution began with this act. It provided for the purchase or construction of four ships of 44 guns each, and of two ships of 36 guns each. For service on board of these six ships, it authorized the President to employ and commission 6 captains, 22 lieutenants, 6 lieutenants of marines, 6 surgeons, 4 chaplains, and 10 surgeon's mates; a total of 54 commissioned officers. The President was to appoint for each ship, a sailing master, purser, boatswain, gunner, sailmaker, carpenter, and 8 midshipmen; the total number of warrant officers was 84. The petty officers, seamen, and marines were to number 1922. The entire naval establishment, according to this act, would consist of 2060 men. To each of the 44-gun ships there were allowed 150 able seamen, 103 "midshipmen" and ordinary seamen, 1 corporal, 1 sergeant, 1 "drum," 1 "fife," and 50 marines. The

[1] Naval Correspondence in the War Department, Navy Department Archives, 1-16.

[2] Richardson's Messages and Papers of the Presidents, I, 148-49.

salary of a captain was $75 a month, and of a lieutenant, $40. The subsistence of a captain was six rations a day. The President was to fix the pay of the petty officers, seamen, and marines.[6]

A synopsis of the debate in the House on this measure has been preserved. Its supporters were for the most part Northerners and Federalists. Thomas Fitzsimmons, of Pennsylvania; Zephaniah Swift, of Connecticut; William Vans Murray, of Maryland; Benjamin Goodhue, of Massachusetts; and William Smith, of South Carolina, argued in behalf of the measure; and James Madison, John Nicholas, and William B. Giles, of Virginia, and John Smilie, of Pennsylvania, spoke against it. The procuring of the proposed ships was argued chiefly with a view to its competency to settle the difficulties with Algiers. It was plain to all, however, that the passage of the measure might lead to the permanent establishment of a navy, and some of the arguments for and against it were based upon this possibility. Giles objected to the "certainty and enormity" of the expense which would attend the procuring of a fleet. He "viewed the establishment of a navy as a complete dereliction of the policy of discharging the principal of the public debt. History does not afford an instance of a nation which continued to increase their navy and decreased their debt at the same time. It is an operation escaping the ability of any nation. The naval competition of the Powers of Europe has produced oppression to their subjects and ruin to themselves. The ruin of the French monarchy, he believed, might be ascribed very much to that cause. A navy is the most expensive of all means of defence, and the tyranny of governments consists in the expensiveness of their machinery. The expensiveness of the French monarchy is the true cause of its destruction. The navy of France furnished the principal item of expense."[7]

William Smith, who represented the "Pinckney district" of South Carolina, was one of the most ardent and persistent of the friends of the early navy. "This country," he declared, "is peculiarly fitted for a navy; abounding in all kinds of naval resources, we have within ourselves those means which other maritime nations were [are?] obliged to obtain from abroad. The nature of our situation, and the navigating disposition of a consid-

[6] U. S. Statutes at Large, I, 350-51.
[7] Annals of Congress, IV, 438-41, 485-98.

erable proportion of our citizens, evince still more the propriety of some Naval Establishment. Perhaps the country is not yet mature for such an establishment, to any great extent; but he believed the period was not far distant when it would [be]. Sweden, with a population not greater than that of the United States, and with more slender resources, maintained a large navy. He saw no reason why the United States, with an increasing population, much individual wealth, and considerable national resources, might not without ruin, do as much; or why the equipment of a squadron, inferior to that of any of the petty nations of Italy, should involve us in an insupportable expense."

From March 27, 1794, when the measure for building the six ships became a law, until April 30, 1798, when the Navy Department was created, the War Department transacted not a little naval business. During this period, a little more than four years, three different secretaries presided over the War Department. The initial work of providing a naval armament fell to Henry Knox, who continued in office until January 1, 1795. On January 2 the Senate confirmed the nomination of Timothy Pickering as Secretary of War. On January 27, 1796, he was succeeded by James McHenry, who had charge of naval affairs until the founding of the Navy Department. Knox superintended the navy for a little less than a year; Pickering for a little more than a year; and McHenry for a little more than two years.[1]

At this time the War Department consisted of two offices, the office of the Secretary of War, and the office of the accountant of the War Department. Some half dozen clerks were employed in the secretary's office, for which the appropriation for salaries in 1794 was $7050. Of this sum $3000 was paid to the secretary. In 1798 this appropriation had increased to $8100. A sum of almost equal amount was the same year appropriated for salaries in the office of the accountant.[2] The accountant's duties were similar to those of the present auditor for the War Department.

Secretary Knox's work in building the six ships consisted of making plans for their construction, procuring materials of various sorts, and selecting officers, naval agents, and constructors. Joshua Humphreys, a skilled ship-builder of Philadelphia; John Hackett, of Salisbury, Massachusetts, who had during the Revo-

[1] Executive Journals of Congress, I, 168, 198.
[2] U. S. Statutes at Large, I, 343, 543.

lution built the celebrated frigate *Alliance;* and other constructors, were consulted upon "the best properties to be adopted as a general plan for the vessels now to be built," and upon other details of their construction. The models submitted by Humphreys, after much consultation and consideration, were adopted. Humphreys' drafts were similar to certain French plans, and his ships were nearly of the same dimensions as some French seventy-fours which had been cut down to make heavy frigates. Humphreys said that one of his ships would be a match for any vessel carrying less than 64 guns. Josiah Fox assisted Humphreys in preparing the "draughts and molds" for the six ships. Washington increased their displacement above that intended by Congress. The measurements of the 44-gun frigates were as follows: length of gun-deck, 174 feet 10½ inches; length of keel, 145 feet; and breadth of beam, 43 feet 6 inches.[10]

The frigates were to be built of live oak and red cedar in all the parts where these durable woods could be used to advantage. It was thought that the live oak and red cedar would last five times as long as white oak. They could be obtained only on the Georgia and Carolina coasts. A master shipwright was sent to Charleston from Boston to superintend the cutting and shipping of the timber. Captain John Barry went to Georgia to expedite the work. Woodcutters and carpenters were sent south from Connecticut, Rhode Island and Massachusetts. A Boston company supplied the ships with sail-cloth; a Maryland company and a Rhode Island company, with cannon; and two New Jersey companies, with cannon balls. The Treasury Department, which at this time greatly exceeded the other departments of the government in importance, bought most of the articles of equipment for the secretary of war. Home industries were patronized to the fullest extent possible. It was found necessary, however, to import "composition metal, sheathing copper, bolts, nails, bunting, and iron kitchens."[11] Not until many years later did the United States supply the bunting for its own flags.

On June 3, 1794, Washington appointed John Barry, Samuel Nicholson, Silas Talbot, Joshua Barney, Richard Dale, and Thomas Truxtun to be captains in the navy. The assistance of these officers in building the ships was desired. Other officers

[10] Goldsborough's Naval Chronicle, 57; State Papers, Naval Affairs, I, 8, 10-11, 19.

[11] State Papers, Naval Affairs, I, 6-10.

were not at this time appointed since their services would not be required until the ships were completed. Each one of the captains was made superintendent of a ship. He had a general oversight of its construction, and he inspected the various materials to see that they were durable and in good condition. Barry, Nicholson, and Talbot had been captains in the Continental Navy; Barney and Dale had been lieutenants; and Truxtun, during the Revolution, had commanded privateers. All had served with distinction. Barry had commanded the *Alliance* during some of her most famous cruises. Talbot's naval exploits were gallant and brilliant. Dale was the senior lieutenant under Jones on board the *Bon Homme Richard* in her memorable engagement with the *Serapis*. Barney, who had greatly distinguished himself in his fight with the *Hyder Ally*, declined his appointment because it placed him below Talbot in rank. He declared, contrary to fact, that Talbot's naval rank during the Revolution was only honorary. On July 18, 1794, James Sever was appointed to fill the vacancy caused by Barney's declination.

In order to construct the ships to the best advantage and to distribute the benefits arising locally from their construction, Washington decided to build the six vessels at as many different ports. The 44-gun ships were to be built at Boston, New York, Philadelphia, and Norfolk; and the 36-gun ships at Portsmouth, N. H., and Baltimore. Whether to build the vessels by contract, or by means of agents of the government, was thoroughly considered by the Secretary of War and the President; and they finally decided to employ agents. In Philadelphia it was feared that if the ship was let to a contractor the unsuccessful bidders would, because of their ill-will and jealousy, raise the price of labor and ruin the successful one. The government obtained building yards at each of the six ports. At Portsmouth the yard was on Langdon's island. At Boston Edmund Hart's shipyard was rented. At New York a building yard was rented from "Marinus Willet, called Corler's Hook on East River." At Philadelphia the yard was located at Southwark. At Norfolk the Gosport navy-yard, at which Virginia built some of her naval craft during the Revolution, was rented from the State.

At each of the six yards a superintendent, naval constructor, navy agent, and clerk of the yard was established. The superintendent had general charge, and the constructor immediate charge.

of the building of the vessel. Joshua Humphreys, the naval constructor in charge of the Philadelphia ship, and the "Principal Constructor of the Navy," was paid a salary of $2000 a year. The navy agent bought all the materials not purchased by the Treasury Department, and was allowed a commission of two and a half per cent on the sums that he expended. He paid the artisans and laborers. His office was modeled on that of the Continental agents of the Revolution. The clerk received, issued, and accounted for all the public property in the yard. He was paid $750 a year.[13]

The following table gives the names of the first superintendents, naval constructors, and naval agents, together with the ports at which they were employed:[14]

Port.	Superintendent.	Naval Constructor.	Naval Agent.
Boston.....	Samuel Nicholson.	George Claghorne.	Henry Jackson.
New York	Silas Talbot.	Forman Cheeseman.	John Blagge.
Philadelphia .	John Barry.	Joshua Humphreys.	Gurney and Smith.
Norfolk..	Richard Dale.	Josiah Fox.	William Pennock.
Portsmouth ..	James Sever.	James Hackett.	Jacob Sheafe.
Baltimore	Thomas Truxtun.	David Stodder.	Samuel and Joseph Sterett.

During the administration of Timothy Pickering the keels of the six vessels were completed and laid upon the blocks, their frames were in part constructed, and much ship-building material was collected at the six yards. Pickering was instrumental in selecting the names of the first ships of the new navy, names which now suggest so many memorable achievements. The actual naming of the several vessels was probably the work of Washington. On March 14, 1795, Pickering laid before the President a list of ten names, "such as have occurred in my conversations with gentlemen on the subject."[15] Five of Pickering's list were selected, the *Constitution, United States, President, Constellation,* and *Congress.* The sixth frigate, the *Chesapeake,* was probably so called because she was built at Norfolk at the southern end of the Chesapeake Bay.

Soon after McHenry became head of the War Department a treaty of peace was signed with Algiers, and in accordance with the act of March 27, 1794, providing for the construction of the six frigates, it was incumbent upon the President to suspend their construction. Washington, who was strongly in favor of creating

[13] State Papers, Nav. Aff., I, 6-8.
[14] State Papers, Nav. Aff., I, 17-21.
[15] Upham's Timothy Pickering, III, 154.

a navy, delayed the carrying out of this provision on the ground that to suddenly stop the work of building the frigates would not comport with the public interest.[15] Many members of Congress, however, wished to abandon the navy and dispose of the ships and the naval materials. It was with difficulty that the Federalists prevented this from being done. A compromise was effected. Three of the ships were ordered to be completed, and the work on the other three was directed to be stopped and their perishable materials to be sold. The three ships whose construction was continued were the *Constitution,* 44, building at Boston; *United States,* 44, building at Philadelphia; and *Constellation,* 36, building at Baltimore. When the Navy Department was established on April 30, 1798, these vessels were almost completed. The *United States* was launched on May 10, the *Constellation* on September 7, and the *Constitution* on October 21, 1797. The average cost of the three vessels was $305,420. This was considered an extravagant price.

In the summer of 1797 work upon these ships was pushed rapidly forward because of the strained relations between the United States and France. A war between the two countries became more and more imminent. In May, 1797, President Adams pointed out the necessity of a fleet for the defense of the nation. On July 1, 1797, Congress passed an act empowering the President to man and employ the three frigates, and in other respects committing the country to the establishment of a navy, a project that had the hearty support of President Adams. This act ordered that the new navy should be governed by the rules and regulations of the Continental Navy, which, it is recollected, were drafted by John Adams in 1775. McHenry, during the last months of his control of the navy was officering, manning, and preparing for sea the *United States, Constellation,* and *Constitution.* In March and April, 1798, Adams sent to the Senate a list of the commissioned officers of these three vessels. McHenry, in one of his last reports, made in April, recommended the building of 20 vessels, of from 16 to 22 guns; and, in case of a war with France, the procuring of six ships of the line.[16]

[15] U. S. Statutes at Large, I, 453-54; Richardson's Messages and Papers of the Presidents, I, 192-93.

[16] Richardson's Messages and Papers of the Presidents, I, 236-37; U. S. Statutes at Large, I, 523-25; Executive Journals of Congress, I, 264, 268; State Papers, Nav. Aff., I, 34.

One frigate was built by the War Department by contract. After the treaty of peace with Algiers of September 5, 1795, had been concluded, the Dey continued to make demands of the United States. Barlow, the American Peace Commissioner, promised him a frigate. This was built for the War Department by James Hackett at Portsmouth, N. H., who launched her on June 29, 1797. She was a 36-gun ship and was named the *Crescent*. She sailed for Algiers in January, 1798, loaded with naval stores for the Dey.[17]

THE FOUNDING OF THE NAVY DEPARTMENT, 1798-1801.

In the spring of 1798 a war with France was imminent. In such a struggle a navy must necessarily play a large part, and the urgency of increasing the small American fleet was great. Armed vessels were immediately needed to protect American commerce, which had already suffered severely from the depredations of the French. Now, an increase in the navy meant much additional work of the War Department. Besides, its administration of naval affairs had been adversely criticised. It was charged with slowness and extravagance. Under these circumstances it was inevitable that men who were familiar with the Naval Department of the Revolution, and with the practice of foreign governments of separating the administration of the navy from that of the army, should demand the establishment of a Navy Department. Moreover, the creation of a strong navy and of a department to administer it were favorite measures with the Federalists. They formed a part of the Federalist plan of strengthening the central government. In President Adams and his Secretary of the Navy, Benjamin Stoddert, the navy found two of its most ardent advocates.

A recommendation concerning the defense of the country and the protection of its commerce in President Adams's First Annual Speech of November, 1797, was the occasion of a proposal to erect a marine office in the War Department. On March 8, 1798, a committee of the House of Representatives which was considering this recommendation reported in favor of establishing a Commissioner of Marine in the War Department, " who shall have charge of the construction, equipment, and supplies of the public

[17] Allen's Navy and Barbary Corsairs, 61; Naval Correspondence of War Dept., Nav. Dept. Arch., 184, 201.

vessels of the United States, and all other matters relating to their naval concerns, which shall be entrusted to him according to law." The committee observed that apparently enormous expenses and unaccountable delays had attended the naval administration of the War Department. It was of the opinion that a Commissioner of Marine would effect important economies. On March 22, Secretary of War McHenry went a step further than the committee. In making suggestions for the betterment of naval administration he proposed, as one alternative, the separation of the marine business from the War Department.[38]

The particular movement in Congress that resulted in the establishment of the Navy Department began on April 2, 1798, when William Bingham, of Pennsylvania, moved in the Senate to appoint a committee "to take into consideration the propriety of instituting a separate Executive department for the purpose of superintending and regulating the various objects connected with the Naval Establishment of the United States." The committee contemplated by Bingham's motion was appointed on the next day, and consisted of Bingham, Henry Tazewell, of Virginia, and Benjamin Goodhue, of Massachusetts. On April 11, Bingham, the chairman of the committee, introduced a bill in the Senate "to establish an Executive Department to be denominated the Department of the Navy." The bill had its three readings on the 11th, 12th, and 16th, and on the latter day it passed the Senate. Before its passage on the 16th an attempt was made by the opponents of the bill to virtually kill it by limiting the period of its operation. Humphrey Marshall, of Kentucky, moved to limit the life of the act to one year, and from thence to the end of the next session of Congress. He, however, accepted the amendment of Elijah Paine, of Vermont, to substitute four years for one. It is significant that both Marshall and Paine came from inland States, where the navy at this time found little favor. The amendment of Marshall was lost; yeas, 10; nays, 15. The vote on the passage of the bill was, yeas, 19; nays, 6. Five of the six negative votes came from the South.[39]

On April 23, the bill received its first and second readings in the House, and on April 26 it was read the third time and was passed. The division of opinion in the House is best disclosed by

[38] Richardson's Messages and Papers of the Presidents, I, 251; Annals of Congress, VIII, 1246; State Papers, Nav. Aff., I, 39.

[39] Annals of Congress, VII, 534, 535, 539-41.

the vote on the reading of the bill for the third time. This vote was, yeas, 47; nays, 41. Of the yeas, 39 votes came from the States north of the Potomac, and 8 from those south.[20] Of the nays, 14 votes came from the States north of the Potomac, and 27 from those south. At this time the members of Congress from the North generally favored, and those from the South generally opposed, naval expenditures of all kinds. It should, however, be remembered that certain South Carolina members were enthusiastic advocates of a navy, and that no man in Congress during the decade of 1794-1803 was so persistent in opposition to a naval armament as Albert Gallatin, of Pennsylvania. He argued in season and out of season that a navy was expensive and useless; indeed, worse than useless, for it caused more evils than it prevented.

No account of the debate in the Senate on the bill establishing the Navy Department has been preserved. A synopsis of the debate of April 25 in the House is recorded in the Annals of Congress. Edward Livingston and John Williams, of New York; Albert Gallatin, of Pennsylvania; Thomas Claiborne, of Virginia; and Nathaniel Macon, Joseph McDowell, and Robert Williams, of North Carolina, spoke in opposition to the measure; while Samuel Sewall and Harrison Gray Otis, of Massachusetts; Samuel Smith, of Maryland; and Robert Goodloe Harper, of South Carolina, defended it.

The friends of the measure argued that in the long run it would result in important economies, and that one department of the government could not efficiently administer the business of both the army and the navy. Samuel Smith said that an expenditure of two million dollars for naval purposes would be authorized this session, and that a secretary of the navy knowing something of naval architecture would be able to save more in the present year than his office would cost in ten. He supposed that the great expense attending the building of the three frigates which composed the present fleet had been chiefly owing to the want of a naval department. Robert Goodloe Harper called attention to the European practice of two military departments, one each for the army and the navy. Harrison Gray Otis made a somewhat novel argument. He said that "it was necessary, even for the sake of appearances, to establish an office of this kind. We ought not

[20] Annals of Congress, VIII, 1426, 1522, 3553-54.

only to prepare measures of defense by sea and land, but, in doing this, we ought to do it in conformity to the opinion of the European world. He thought $5000 a year would be well expended in purchasing the good opinion of the European nations in this respect, and particularly that of France."

Talk like that of Otis has never failed to bring forth a spirited reply in the House of Representatives. On this occasion Robert Williams declared that the policy of Otis was the "most fatal of any other to this country. He believed that the less we had to do with European politics, and their mode of administration, the better." Those countries that have established large navies are "involved in debt which they never can, and never will, pay." Gallatin argued that the proposed measure would cause an additional expense and that the War Department was quite competent to manage the naval business. Livingston, however, conceded that the secretary of war could not be supposed to be acquainted with both army and navy affairs. But, it would not do to appoint a ship-builder secretary of the navy, for such a person was not "fit to be one of the great council of the nation; and it must be recollected that the person who holds this office will become one of the councillors of the President on all great concerns." The principle that no person in the government was to have business under his direction which he did not understand, was of limited application. Otherwise, there must be in the War Department "commissioners of gun-barrels and ramrods." John Williams and Thomas McDowell opposed the measure because it involved the establishment of a large and permanent naval force.[21]

The bill creating the Navy Department became a law on April 30, 1798, being on that day signed by President Adams. This law comprises five sections and is quite brief. It provides that "there shall be an executive department under the denomination of the Department of the Navy, the chief officer of which shall be called the Secretary of the Navy." The duty of this officer "shall be to execute such orders as he shall receive from the President of the United States, relative to the procurement of naval stores and materials, and the construction, armament, equipment, and employment of vessels of war, as well as all other matters connected with the naval establishment of the United States." The law authorized the secretary of the navy to appoint a principal

[21] Annals of Congress, VIII, 1545-54.

clerk and such other clerks as he should think necessary. The secretary was to receive a salary of $3000 a year, payable quarterly; the clerks were to receive the same salaries as the clerks of the other executive departments. He was directed to take possession of all the records pertaining to the navy, which were deposited in the War Department. In case of a vacancy in the secretaryship, the principal clerk was authorized to take possession of the records and documents of the Navy Department.[28]

The day after President Adams signed the bill he nominated George Cabot, of Massachusetts, to be Secretary of the Navy. Adams considered Cabot "eminently qualified" to fill the position.[29] On May 3, the Senate confirmed the nomination. Timothy Pickering, the Secretary of State, seems to have had doubts of Cabot's accepting the proffered station, for, when he sent Cabot his commission, Pickering wrote to him a personal letter, urging him to make sacrifices for the public advantage and to accept the appointment. On May 11, Cabot wrote to Pickering, declining the office on the ground that he did not have the mental or physical qualifications demanded of a secretary of the navy. Cabot's belief in his own unfitness seems to have been honest, but no doubt his dislike of publicity and his love of indolence and repose were influential in causing his declination. It is well known that at this time the Federal offices had few attractions for first-rate talent.

Some of the qualifications for a secretary of the navy which Cabot considered requisite he may not have possessed. Indeed, measured by Cabot's standard, there have been but few secretaries of the navy who have not fallen short. Had the President applied it, the office might have remained vacant indefinitely. Cabot conceived that the head of the Naval Department should possess "considerable knowledge of maritime affairs; but this should be elementary as well as practical, including the principles of naval architecture and naval tactics." Above all, he should possess the "inestimable secret of rendering a naval force invincible by any equal force of the enemy. Thus a knowledge of the human heart will constitute an essential ingredient in the character of this officer, that he may be able to convert every incident to the elevation of the spirit of the American seamen.

[28] U. S. Statutes at Large, I, 553-54.
[29] Works of John Adams, I, 553-54.

Suffer me to ask how a man who has led a life of indolence for twenty years can be rendered physically capable of these various exertions." [24]

Although Cabot never acted as secretary of the navy, he legally held this office from the date of his confirmation until his declination was accepted. His "term of office" was not longer than fifteen days, for, on May 18, the President nominated Benjamin Stoddert, of Georgetown, District of Columbia, to fill the vacancy. Stoddert's nomination was confirmed on the 21st. It was some days before he reached Philadelphia from Georgetown, and not until the 18th of June did he enter upon the business of his office. On this day the Secretary wrote three letters, one to the Treasury Department asking for a statement in respect to the purchase of the twelve ships authorized by Congress, and the other two to Captain Jeremiah Yellott, navy agent at Baltimore. These letters were the first that were written by the American Navy Department. The second letter to Yellott is of general interest and is worth transcribing:

"I mentioned to you in a Letter of to Day that I had not before entered upon the duties of my Office, in fact I have not yet taken the oath of office, this I shall do Tomorrow, and by the next Post shall write you officially; my opinion is that the *Montezuma* ought to be purchased. I shall Tomorrow consult the President on the subject, in the meantime I wish Mr. Taylor would suspend her loading.

"Mr. McHenry [25] has been absent ever since my arrival here—now Mr. Wolcot [26] is gone to New York, these circumstances have kept back the Business of my Department. I hope it will be better attended to in the future, and with the assistance of Gentlemen of your knowledge and worth can be obtained, I shall not despair of discharging the duties of my Office with promptness and economy, two things highly essential to be observed in the present crisis of our affairs." [27]

Stoddert remained at the head of the Navy Department until April 1, 1801. Stoddert was a native of Maryland, and a merchant by profession. He served with distinction in the Continental Army, rising to the rank of major. Owing to a severe wound

[24] Lodge's George Cabot, 144, 155-57.
[25] James McHenry, Secretary of War.
[26] Roger Wolcott, Secretary of the Treasury.
[27] General Letters, Nav. Dept. Arch., I, 4.

which he received at the battle of Brandywine, he was compelled to leave the active service. For several years he served as secretary of the Continental Board of War. His term of service in the department amounted to not quite three years. This period, when the foundation of the American Navy was being laid, is one of the most important in its history. Every part of the naval service underwent a most rapid development. Stoddert, who was an ardent friend of the navy, was a worthy and efficient administrator. In his own words, which are just and accurate, he discharged his "duty to the Public with zeal and diligence, and not without judgment."[28] While other members of the Cabinet intrigued against the President, he remained true to his chief. His task seems to have been as uncongenial to him as possibly it would have been to Cabot, but, against his own inclination, he manfully stayed with it. A few months after entering upon the duties of his office he wrote: "In truth my determination has always been, and will continue to be, to quit it the moment when it will not be dishonorable to quit the public service."[29] Charles W. Goldsborough, who, beginning with 1798, served the department almost continuously for more than forty years, said that the selection of Stoddert was the most fortunate that could have been made, and that "to the most ardent patriotism he united an inflexible integrity, a discriminating mind, great capacity for business, and the most persevering industry."[30] While Goldsborough's characterization sounds somewhat epitaphic, it is just.

The Navy Department under Stoddert consisted of two offices, the secretary's office and the office of the accountant of the navy. In addition to the secretary of the navy, the secretary's office comprised the principal clerk, four or five subordinate clerks, and a messenger. In 1800, the pay-roll of the secretary's office amounted to $9152. Almost one-half of this sum went to the secretary, for, in 1799, his yearly salary was increased to $4500. The principal clerk, or chief clerk of the department as he was soon called, was paid $1200 a year. The first to fill this position was Garrett Cottringer.[31] In the latter part of 1799 he was succeeded by Abishai Thomas, who held the office until early in Jefferson's administra-

[28] General Letters, Nav. Dept. Arch., III, 496.
[29] General Letters, Nav. Dept. Arch., I, 334.
[30] Goldsborough's Naval Chronicle, 86.
[31] U. S. Statutes at Large, I, 730; II, 64; Congress Letters, Nav. Dept. Arch., I, 17-18.

tion. Employed in Philadelphia, outside of the secretary's office proper, was Robert Gill, navy storekeeper, at a salary of $1000; and Joshua Humphreys, "Principal Naval Constructor of the United States," at a salary of $2000. During the early history of the department Humphreys was one of its most important officials. He was the chief technical adviser of the secretary of the navy. He was a man of marked ability and skill in his profession.

The office of the accountant of the navy was established by a statute, dated July 16, 1798. The accountant was appointed by the President and confirmed by the Senate. He was the auditor for the Navy Department. He was charged with the settlement of all accounts for moneys advanced and stores issued and distributed by or under the direction of the secretary of the navy. His salary, which was first fixed at $1600 a year, was, in 1799, raised to $2000. The accountant employed some six or seven clerks. The pay-roll of the office in 1800 amounted to $9250.[28] The first accountant of the navy was William Winder, of Maryland, who entered upon his duties in September, 1798. Winder, during the Revolutionary War, had served as a commissioner of the Navy Board of the Middle Department. In January, 1800, he was succeeded by Thomas Turner, of Georgetown, District of Columbia, who was the accountant of the navy until his death in 1816.

Stoddert continued the naval agencies which the War Department had established at Portsmouth, Boston, New York, Baltimore, and Norfolk. The navy agent at Philadelphia had resigned in June, 1795, and the Secretary of War had vested his duties in the Public Purveyor of Supplies and in the Principal Naval Constructor. On entering upon the work of his office, Stoddert found the building and purchasing of vessels to be among his chief duties. To aid him in this work he appointed navy agents at several of the less important Atlantic ports. In 1798 he chose agents for Newburyport, Massachusetts; Newport, Rhode Island; Middletown, Connecticut; Wilmington, North Carolina; Charleston, South Carolina; and Savannah, Georgia. In 1799 navy agents were appointed for Salem, Massachusetts; Norwich, Connecticut; and the District of Columbia.[29] The usual commission of the navy agents was two per cent on the moneys that

[28] U. S. Statutes at Large, I, 610, 730; II, 64.
[29] General Letters, Nav. Dept. Arch., I, 342-43, 530; II, 24, 122.

they expended. Their principal duty was to purchase naval supplies of all sorts—timber, hemp, copper, powder, cannon, canvas, pork, beef, and bread. The first navy agent for the District of Columbia was William Marbury, who later attained notoriety in the famous case of Marbury *versus* Madison. He had resided at Annapolis, and was appointed navy agent to purchase materials for a 74-gun ship, which was to be constructed at Washington. In May, 1800, when the department was preparing to remove from Philadelphia to Washington, Stoddert appointed George Harrison navy agent at Philadelphia. Harrison's name is worth recalling, for he performed his duties most creditably for many years. Stephen Higginson was the Federalist navy agent at Boston.

The naval war with France was almost coincident with Stoddert's term of office. During this irregular and desultory conflict the little navy did itself much credit. Commodore Thomas Truxtun achieved the most notable successes. In the *Constellation,* 38 guns, he captured the two French ships, the *Insurgente,* 40 guns, and the *Vengeance,* 44 guns, after two hard-fought engagements. The American fleet operated chiefly in the West Indies. It was usually divided into four squadrons. These were the St. Kitts or Guadaloupe squadron, Santo Domingo squadron, Havana squadron, and Surinam squadron. The St. Kitts and Santa Domingo squadrons were the largest and most important. At Basseterre and Cape Francois the Navy Department had navy agents who received provisions sent from the United States for the fleet, purchased other necessary supplies, and provided for the maintenance of the French prisoners. These agents also negotiated for the exchange of prisoners, and when they accumulated shipped them to the United States. For the supply of the Havana squadron the department for a time in 1799 employed an agent at Havana. In December, of that year, he was discharged and his duties were vested in the American consul at Havana. The consul at Surinam assisted in supplying the Surinam squadron. The navy agents in the West Indies were paid a commission of five per cent on all moneys expended. Sometimes their commissions were supplemented by a fixed salary.[34]

During Stoddert's administration, the Navy Department was somewhat peripatetic. For the first two years it was regularly

[34] General Letters, Nav. Dept. Arch., II, 26, 53, 68; IV, 55-57.

located at Philadelphia. During the autumn of 1798 and 1799, however, it was temporarily situated at Trenton, leaving Philadelphia on account of an epidemic of yellow fever. The Secretary of the Navy was not pleased with the temporary capital at Trenton. He wrote that the town was an indifferent place for the officials of the government, but that they would, however, have "leisure to think, and that may prove an advantage." For its quarters in Philadelphia the department paid an annual rental of $800.[28] In the autumn of 1798 Stoddert was absent from the department for a month. He made a visit to Georgetown, and after the frosts had checked the fever at Philadelphia returned to that city with his family. This incident assumes interest, since the department was for the first time left without its regular head. Timothy Pickering, the Secretary of State, was placed in charge of the Navy Department, and became "Acting Secretary of the Navy." He, however, signed only a part of the correspondence, since Cottringer, the chief clerk, and Goldsborough, a subordinate clerk, shared in this work.

The Navy Department made a third move in June, 1800, and this time from Philadelphia to the "City of Washington," then a city only in name and plan. On May 30, Stoddert issued to his clerks, "Orders for the Removal of the Department to the City of Washington." This document is of interest, since it throws light upon the details of the moving of the capital which have been greatly obscured by the fancy of ingenious writers. The document seems to indicate that the reputed impecuniosity of government clerks was at this time a reality. It read as follows:

"The President having directed the offices to be opened at the City of Washington on the 15th of June, the Gentlemen belonging to the offices of the Secry. and Accountant of the Navy will regulate their affairs accordingly. There will be an advance of as much money to each person as is due at the time for salary—perhaps a little more, but this cannot at present be counted upon.

"Vessels are daily preparing and carrying the furniture of the Gentlemen in the other offices. Such things as can be spared may be sent as soon as the owners please in such vessels at the Public Expence. But Mr. Whelan, the Purveyor, must be consulted in every instance—he having directions from the Treasury

[28] General Letters, Nav. Dept. Arch., I, 155; V, 137.

particularly on this subject. It is intended to close the offices here on Saturday the 7th Inst." [36]

The records and original papers of the department were either considered too valuable to be moved on board the vessels, or it was thought that a quicker trip could be made overland. They were loaded into a wagon, and George Sutherland, a clerk of the department was detailed by the Secretary of the Navy to accompany the wagon from Philadelphia to Washington to guard its contents. Sutherland rode behind the wagon on horseback. The furniture and printed books of the department were loaded on board vessels, which sailed down the Delaware and up the Chesapeake into the Potomac. All the clerks of the secretary's office, except one whose private interests forbade and who therefore resigned, removed to Washington. Stoddert arrived in Washington on June 15 and opened his office on the 18th. Sutherland and the records had not yet come, and the Secretary of the Navy was compelled to transact the naval business for a few days under serious difficulties. On the arrival of the heavy articles which had been shipped on board the vessels, they were stored in Tobias Lear's warehouse in Georgetown, where they remained until temporary quarters were obtained.[37]

When the removal to Washington was first contemplated, Stoddert had counted on having "six rooms in the Treasury House for my office." Finding that these could not be spared he wrote to Marbury, the naval agent in Georgetown, to have two of "the six houses of Forrest and Templeman," one for the Navy Department, and the other for the State Department, so far completed as to answer for offices during the summer. The "Six Buildings," as they were for a long time called, were situated between the White House and Georgetown on Pennsylvania Avenue. The Six Buildings were not ready for occupancy when the departments moved to Washington in June. The State Department obtained temporary quarters and did not move into one of the Six Buildings until August. The exact location of the Navy Department during the summer of 1800 has not been ascertained, but its movements most probably corresponded with those of the State Department. About the first of May, 1801, the Navy Department moved into permanent quarters in the "Old

[36] General Letters, Nav. Dept. Arch., III, 423.

[37] General Letters, Nav. Dept. Arch., III, 439, 442, 469; Records of the Columbia Historical Society, III, 143 .

War Office," which was situated near the White House. The southern end of the present State, War, and Navy Building is on or near the site of the Old War Office. In 1800, Washington could boast of little else than magnificent views and distances. Here and there were a few dwelling houses, often wide apart, and separated by "slashes," which were covered with scrub oaks and alders. The construction of four government buildings had been begun—the capitol, President's house, treasury office, and war office. Only the treasury office was ready for occupancy. In the spring of 1800 the work of expediting the construction of the President's house fell to the Secretary of the Navy. The building of the first foot-ways in Washington also was superintended chiefly by Stoddert. In these rude and narrow walks which connected the President's house with the capitol and with Georgetown, one may discover the beginning of the present superior system of paved streets in Washington.[28]

Although the country was at war with France until nearly the close of Stoddert's administration, yet practically the whole naval increase in ships was made in 1798 and 1799. During these two years the building and purchasing of ships were among the chief activities of the department. At the close of 1797 three ships were in service; at the close of 1798, twenty; and at the close of 1799, thirty-three. Of these thirty-three vessels, five were 44's; four, 36's; seven, 32's; three, 24's; seven, 20's; four, 18's; and three, 14's. Nine galleys were built for the protection of the Southern ports, and eight revenue cutters were obtained from the Treasury Department. These fifty vessels, large and small, comprised the naval force during the war with France. Some of them, the department built at the navy-yards, which had been rented by the War Department; others, it had built under contract; and still others, it purchased. Several were built by the patriotic citizens of the chief seaports, who raised the necessary money by subscription. Vessels were built in this way by the citizens of Newburyport, Salem, Boston, New York, Philadelphia, Baltimore, Norfolk, and Charleston. The department completed the construction of the *President*, *Chesapeake*, and *Congress*, which had been commenced in 1796.[29]

[28] General Letters, Nav. Dept. Arch., III, 94, 157, 305, 311, 366, 372, 390; IV, 62, 85, 332, 336.

[29] State Papers, Nav. Aff., I, 58-59; General Letters, Nav. Dept. Arch., II, 123-24.

In selecting officers for his fleet Stoddert received aid from many sources. They were usually chosen from the locality in which the ship was built. The captains often chose their lieutenants and warrant officers. For the highest positions the requests and recommendations of influential friends and relatives had much weight. Congressional influence was not so pervasive or powerful as now. The applicants were numerous and persistent. President Adams took with him to Quincy, Massachusetts, where he spent his summers, both blank commissions and warrants, which he filled out whenever he wished to make appointments. Owing to the haste and the exigency of the service, officers frequently did not receive their commissions or warrants until after their first cruise.

Under Stoddert the list of captains in the navy was increased from 3 to 28. According to Goldsborough's Naval Chronicle, there were in the navy on March 3, 1801, 7 masters commandant, 110 lieutenants, and 354 midshipmen. Many of the famous names of the Old Navy first appeared in the navy list during the administration of Stoddert—Preble, Bainbridge, Decatur, Chauncey, Stewart, Barron, John Rodgers, James Biddle, and O. H. Perry. In response to the importunities of his friends and his country's friends, Stoddert swelled the number of midshipmen until he confessed that he was ashamed of himself. Many of the most celebrated officers of the Old Navy served their apprenticeship in it as midshipmen. The most suitable age for a young man to enter the grade of midshipman was from twelve to eighteen years. It was possible in the early years of the navy for an intelligent young officer, fortunate and skilful in his profession, to pass through the grades of midshipman, lieutenant, and master commandant, and become a captain, the highest grade in the navy, at the age of thirty or thirty-five. Stoddert appointed many youths who knew little of the sea to be midshipmen. He insisted, however, that they should be "sprightly well-educated young men of good principles and spirit."[40] Chaplains and schoolmasters were provided to teach these lusty youths the rudiments of navigation and mathematics.

In striking contrast with the experiences of the Navy Department in both the Revolutionary War and the War of 1812 was the little difficulty that was encountered during the war with

[40] General Letters, Nav. Dept. Arch., II, 142

France in enlisting seamen. Enough men to man a frigate could usually be enlisted in a week's time. One reason why the seamen entered more readily was because the enemy had few vessels afloat superior to those of the Americans.[41] At this time seamen enlisted for a year, or for a year and thence until the end of their cruise. A captain serving in the West Indies usually returned with his vessel at the end of a year's cruise, dismissed his men, and while his vessel was repairing and refitting enlisted another crew. This practice makes it difficult to ascertain the number of the enlisted force of the navy. The number of seamen was not fixed by statute but by the President, and the records of enlistment seem to have disappeared. To fully officer and man the fifty vessels that composed the American Navy in 1800 required 8400 men.[42] If we assume that two-thirds of these vessels were completely officered and manned at one time, the total number of men in the navy may be estimated at 5600. The maximum strength of the Marine Corps as fixed by law was 1085 officers and men.

Difficulties in respect to rank early arose in our navy. During Stoddert's administration Captains Truxtun and Talbot had a long and bitter contention over their relative standing. The Secretary of the Navy and the President disagreed upon the points at issue, and the dispute was not ended until Talbot withdrew from the navy. "This avarice of rank in the infancy of our Service is the Devil," Stoddert wrote in 1799.[43]

For many years an agitation in behalf of higher naval ranks was conducted in the Navy Department, in the navy, and in Congress. This subject was earnestly considered by Secretary Stoddert. In March, 1800, he asked Congress to authorize the President to appoint two admirals, two vice-admirals, and two rear-admirals. He said that he was "well aware of the ridicule that may attach to the idea of making Admirals before we have such ships as Admirals usually command, and when our whole Naval force amounts to no more than eleven Frigates, or fifteen if we call every ship carrying 32 Guns a Frigate, and twenty smaller vessels." He believed, however, "that Justice and Policy require that the brave and experienced officer should be rewarded, and the Young stimulated, by conferring upon long extraordinary skill and valor the usual Naval

[41] Congress Letters, Nav. Dept. Arch., II, 124.
[42] State Papers, Nav. Aff., I, 59-63.
[43] General Letters, Nav. Dept. Arch., II, 254.

Honors and Distinctions." In response to Stoddert's recommendation the Naval Committee of the House in April introduced a bill which provided for one vice-admiral and four rear-admirals. It did not pass the House. The captains of the navy in all probability brought their views on the subject of higher rank to bear on the secretary. Stoddert wrote in 1799 that Captain Barry "is old and infirm, and not satisfied that he is not made an Admiral."[44]

Various tasks which fell to the Secretary of the Navy were incident to a new and rapidly developing naval service. He revised the Rules and Regulations of the Navy. He was instrumental in having revised in 1800 the penal code of the navy, which Congress had adopted in 1799. He drafted a bill for the government of the Marine Corps. He established six navy-yards, and began the work of locating naval docks. In papers addressed to Congress he vigorously pointed out the need of these institutions. He began the construction at Newport, Rhode Island, of the first naval hospital. It was to be a small building and its cost was not to exceed $4000.[45] In 1801 the Republicans stopped the work upon it. In respect to naval construction or to the location of navy-yards and docks, the secretary sought the advice of his chief naval constructor, Joshua Humphreys. The captains of the navy sometimes assisted him with those duties which lay particularly within the field of their professional knowledge. The work of the Navy Department was much simpler and much less technical in the first years of its existence, than is its work at the present time. A civilian secretary, such as Stoddert, was therefore able to master most of the department's problems.

No work of Stoddert was more important or far-reaching than that which had to do with the establishment of navy-yards. Here he set his seal, which remains to this day. The navy-yards are the manufactories, repair-shops, and storehouses of the navy; the Navy Department, in one of its most important functions, is the central office that superintends the activities of the navy-yards. In the work of the navy, especially in providing, repairing, and improving the naval *materiel*, these establishments are of the greatest importance. They must of course be situated at seaports or at ports convenient to the sea. Several attempts to obtain

[44] Congress Letters, Nav. Dept. Arch., I, 55-56; Annals of Cong., X, 676; General Letters, I, 515.

[45] General Letters, Nav. Dept. Arch., IV, 31.

permanent navy-yards, that were made, were unsuccessful. A plan for the navy, which was prepared by John Paul Jones in 1777, provided for three navy-yards. In January, 1797, Secretary of War McHenry recommended to Congress the purchase of a navy-yard. In February, upon the request of the Committee of the House on Naval Equipment, he reported an estimate of the "probable cost of a Scite for a Navy Yard and the Buildings necessary thereto."[46] He thought that one hundred acres of land located within fifteen or twenty miles of a large city would be needed. In July, 1798, Robert Goodloe Harper, of South Carolina, introduced in the House a resolution "that it is expedient to enable the President to establish one or more dock-yards for the use of the United States, with suitable buildings for marine stores, arsenals, and magazines."[47] In December, Stoddert, in a communication to the House, pointed out the need of the navy for ample building yards.

On several important occasions when Congress has refused the Navy Department specific authority to make needed improvements, the department has obtained the authority desired by a liberal construction of the statutes. Stoddert was the first secretary of the navy to resort to this expedient. On February 25, 1799, Congress passed an act appropriating money for the construction of six 74-gun ships. With the exception of the *America*, which was constructed during the Revolution, Congress had not previously undertaken to build vessels as large as these. The yards, which had been rented, had already proved to be too small for the construction of the 44's; considerable additional expense had been incurred in moving and removing the timbers in them, necessitated by their restricted quarters. The inconvenience and expense of building the 74's in these yards would be still greater; and, moreover, considerable improvements, such as the building of wharves, slips, and sheds, would have to be made. It did not appear economical for the government to improve private property. The President and the Secretary of the Navy, therefore, determined to purchase permanent building grounds for the navy. They derived their authority for making the purchases from the act of Congress, directing the building of the six 74-gun ships.[48] In order to properly carry out this act, they argued that ample

[46] State Papers, Nav. Aff., I, 26-27.
[47] Annals of Congress, VIII, 2083.
[48] State Papers, Nav. Aff., I, 74, 84.

building grounds were necessary. It must be said, however, that the incidental effect of these purchases, the acquisition of six permanent navy-yards, strongly appealed to the President and the Secretary of the Navy, ardent Federalists, and open advocates of a large and efficient navy.

Stoddert decided to build the six ships in as many different places, although he thought that ultimately three building yards would be found sufficient for the needs of the navy; one in New Hampshire or Massachusetts, one on the Hudson River, and one on the Chesapeake Bay.[48] By May, 1799, he had decided to build one of the ships at Washington, on ground already owned by the Federal government. In August, he sent Humphreys from Philadelphia to the new capital to locate the site. After this had been determined, Humphreys, in October, made another trip to Washington to fix upon the proper place for wharves. Stoddert at first hoped to have the land transferred to the Navy Department without expense; but finally, in order to obtain a good title and to prevent the carrying of the business to Congress, he consented to pay $4000 for the ground selected. On March 17, 1800, the transfer was made and the Navy Department came into possession of its first navy-yard. It contained 47.7 acres, and was situated on the Eastern Branch of the Potomac, within the city of Washington, about one-half mile from the capitol. In January, 1800, Stoddert ordered Captain Thomas Tingey to proceed to Washington and superintend the construction of the 74-gun ship and the improvements to be made in the yard. Tingey was well qualified for this position. He had at one time visited the chief navy-yards of England.[49]

The yard at Gosport, Virginia, which the United States had been renting since 1794 from the State of Virginia, next received Stoddert's attention. He first obtained an act of the Virginia Legislature authorizing the transfer of the property. Stoddert thought that Virginia ought to give the land to the United States, but she was disposed to make as good a bargain as possible. The act of the legislature called for the appointment of two appraisers to value the land. The Governor of Virginia selected Thomas Nelson, Jr.; and the Secretary of the Navy, William Pennock, the navy agent at Norfolk. These two men

[48] General Letters, Nav. Dept. Arch., II, 43.

[49] General Letters, Nav. Dept. Arch., II, 268-69, 426-27; III, 1, 3, 34-35, 119.

decided that the 16 acres comprising the yard were worth $12,000. Stoddert willingly paid this sum, since he greatly desired to obtain a navy-yard at this place, and he knew that Congress would not consent to its purchase if the business was referred to that body. As some misunderstanding arose about paying over the money, the deed was not signed until June 15, 1801.[31]

A yard at Portsmouth, New Hampshire, was acquired from William and Sarah Dennett on June 12, 1800, for $5500. It consisted of an island, known as Fernald's or Dennett's Island, and contained 58 acres. The navy agent at Portsmouth acted in behalf of the department in making the purchase. The various sites for a navy-yard around Boston were viewed by Joshua Humphreys, who selected a location at Charlestown. Dr. Aaron Putnam was authorized by the department to purchase the land. He bought from various persons for $37,348 ten adjacent lots, amounting in the aggregate to 34 acres. The deed for the first lot purchased was dated August 26, 1800; and for the last, April 2, 1801.[32]

Stoddert first wished to locate the Philadelphia navy-yard on the Delaware, a short distance below Philadelphia; and in June, 1800, he had an army engineer examine the river at this point with a view to its fortification. Later, he sent Humphreys to inspect the eligible sites around the city. Humphreys reported in favor of a situation north of Philadelphia, but in November, the Secretary of the Navy decided to buy the grounds in the District of Southwark in Philadelphia, which the department had been renting. These grounds could be obtained immediately, while those which Humphreys had selected could not be. The site at Southwark was purchased by Humphreys for the department on January 20, and February 20, 1801. It embraced 11 acres, and cost $37,000. On February 23, 1801, James and Ebenezer Watson, navy agents at New York, purchased a navy-yard situated on Wallabout Bay in Brooklyn, Long Island. It comprised a tract of 40 acres, known as Martynes Hook. It cost the department $40,000.[33]

[31] General Letters Nav. Dept. Arch., III, 116-17, 302, 516; IV, 193-95; Hening's Statutes of Virginia New Ser., II, 246-47.

[32] Archives of the Bureau of Yards and Docks, Nav. Dept., Deeds to Portsmouth and Boston navy-yards.

[33] General Letters, Nav. Dept. Arch., III, 412-13; IV, 4, 116-17; Archives of the Bureau of Yards and Docks, Nav. Dept., Deeds to the Philadelphia and New York navy-yards.

During the last weeks of Adams' administration, which ended on March 4, 1801, the purchases of the yards at Boston, New York, Philadelphia, and Norfolk were being made. Stoddert urgently pressed each of the four agents, who were commissioned to buy these yards, to complete their work at once. It was plain that the Secretary of the Navy feared that his work might be undone by the incoming Republican administration, and was determined, if possible, to have the whole business consummated before he turned the keys of the department over to his successor.[54] When he retired on April 1, 1801, the purchasing of the six navy-yards was virtually completed.

On February 25, 1799, three important Federalist measures were passed.[55] The act which provided for the building of six 74-gun ships has already been referred to. The second act appropriated $50,000 for the establishment of two docks for the purpose of repairing naval vessels. In December, 1798, Stoddert had reported to the Committee of the House on the Naval Establishment that "docks will be highly necessary in repairing our ships, to avoid the tedious, expensive, and sometimes dangerous operation of heaving down. They can undoubtedly be made in the Eastern States, where the tides rise very considerably; probably in New Hampshire, Massachusetts, and Rhode Island." He said that, if they could be made to equal advantage to the southward, it would be well to have a dock near the entrance of the Chesapeake Bay. It was in pursuance of this recommendation that Congress passed the act of February 25, 1799, providing for two docks. Various interested persons now recommended sites for docks to the Secretary of the Navy. In August, 1799, he appointed Stephen Sayre, who had seen all the principal docks in Europe, to visit the chief ports of New England and report on the advantages which they offered. In January, 1800, he sent Humphreys to New England for the same purpose. Humphreys visited all the principal ports to the eastward of New York, and made an elaborate report on various eligible sites for docks. He considered a site at Newport as the most superior place for a dock, and the Secretary of the Navy agreed with him. Adams' administration came to a close before this business was concluded. Moreover, the appropriation was too small to have done more

[54] General Letters Nav, Dept. Arch., IV, 116-17, 166, 183, 193-95, 203, 206, 209-11, 214, 228.

[55] U. S. Statutes at Large, I, 62.

than purchase the sites. It was certainly not the fault of the Secretary of the Navy or of his plans that docks were not erected. When Humphreys was about to leave for New England on his tour of inspection, Stoddert instructed him that it was proper that a dock "should be begun, and at a place, and on a plan capable of great extension. Although a Dock sufficient to contain not more than one Ship will be attempted in the first instance, it ought to be foreseen that it may be necessary to annex to it hereafter Docks to contain 20 Ships of the line, and that the works now to be erected should constitute a permanent part of the whole establishment." Many years, however, were to elapse before the American Navy was to have a single dock; and even at the present time its docking facilities are hardly so extensive as those planned by the first Secretary of the Navy.[86]

The third act of February 25, 1799, appropriated $200,000 for the purchase of timber, or land upon which timber was growing. This measure, which contemplated the purchase of live oak and live-oak lands for the future use of the navy, was a favorite one with the Federalists, and had more than once been defeated by the Republicans. In carrying out the latter part of the act, the purchase of timber lands, the Secretary of the Navy bought for $22,500 Grover's Island and Blackbeard's Island, which lay off the coast of Georgia.[87] These islands belonged to the Navy Department until about 1890, when they were turned over to the Interior Department.

Stoddert showed a wise foresight in providing for the future needs of the navy. He believed that every material used in the construction and repair of a ship could be made in America, if the manufacturers were given the proper encouragement. He advanced to Samuel Lyman, of Springfield, Massachusetts, $1000 to aid him in the manufacture of canvas. Paul Revere, of Boston, more famous for his ride to Concord than as a manufacturer of copper, was advanced $10,000 to assist him in purchasing a mill and apparatus for making dry-rolled sheathing copper for the navy.[88] Stoddert believed that if the growers of hemp were encouraged, a sufficient quantity for the needs of the navy could be

[86] State Papers, Nav. Aff., I, 66, 89-102; General Letters, Nav. Dept. Arch., II, 300-01; III, 136-44.

[87] Goldsborough's Naval Chronicles, 351.

[88] General Letters, Nav. Dept. Arch., II, 49; V, 166; Miscellaneous Letters, II, 14, 32.

grown in the river valleys of the Ohio, Mississippi, Susquehanna, Potomac, and James.

The ratifying of the treaty of peace with France early in 1801 brought to an end the naval war, and necessitated the placing of the navy upon a peace footing. One of the last acts of the expiring Federalist government, which was passed on March 3, 1801, provided for a naval peace establishment. This act authorized the President to sell all the vessels of the navy except thirteen, whose names were given, and of these to keep six in commission in time of peace and to lay up the remaining seven in ordinary. All the officers except those needed were to be discharged. Of the officers of the higher grades, 9 captains, 36 lieutenants, and 150 midshipmen were to be retained; the rank of master commandant was abolished. Charles W. Goldsborough, in his Naval Chronicle, says that this act originated with the avowed friends of the navy, "who were impressed with the conviction, that the existence of the establishment could be preserved by no other means, than by reducing it to the lowest possible scale." This does not seem to be the whole truth. The necessity of reducing the naval establishment in 1801 to a peace footing was fully recognized by the Federalists. On January 12, 1801, the Secretary of the Navy made a report to a committee of the House in which he recommended reductions in the navy similar to those made by the act of March 3. The thirteen frigates which were reserved by this act were those recommended to be reserved by Stoddert. He said that it would be good economy to sell the rest of the public vessels, because they were built of materials that did not promise to last, and in addition they were too small to form a part of the national defense. In the place of these he recommended that the government should build twelve 74's and thirteen frigates. Stoddert wished to retire all the higher officers not needed for the naval service in time of peace on half-pay. These were to remain subject to the call of Congress. The original bill in Congress contained provisions in line with Stoddert's wishes. The Republicans, however, carried an amendment dismissing from the navy all the officers not required on a peace footing, after giving them four months' extra pay.[*]

[*] U. S. Statutes at Large, II, 110-11; Goldsborough's Naval Chronicle, 181; State Papers, Nav. Aff., I, 74-78; Annals of Congress, X, 1056-59.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE COMING OF EXPLOSIVE ENGINES FOR NAVAL PURPOSES.

By REAR-ADMIRAL C. M. CHESTER, U. S. Navy.

In a letter to the Navy Department, dated November 28, 1904, Mr. A. T. Chester, who was at that time a lieutenant in the navy, gave, I believe, a fairly good digest of the knowledge then extant regarding the important matter of explosive engines. The following is a copy of his letter in full:

WASHINGTON, D. C., November 28, 1904.

SIR.—1. I respectfully submit, for the Department's consideration, the following data and arguments relating to the adoption of internal explosive engines for motive power in the vessels of the navy, using either coal or oil fuel.

2. I understand the U. S. S. *Vesuvius* is being fitted up as an experimental boat for torpedo work, and I will take that vessel as an example upon which to base an argument.

3. Her present plant, including boilers, engines, and auxiliaries, weighs 603,380 pounds and is rated as having 3774 horsepower.

4. Gas engines generating 4000 horsepower have been constructed, and the German Navy is to-day building a vessel to be propelled by a 4000 horsepower engine; so this is not a matter of theory. After consulting manufacturers who are prepared to build marine gas engines up to 5000 horsepower, carefully examining engines now in use, and allowing 20 per cent increase for special strength required for naval purposes, I think I can safely state that oil engines up to 5000 horsepower may be designed, allowing 20 pounds weight of machinery per horsepower, and gas engines, including producers and auxiliaries, allowing 30 pounds to the horsepower. A gas plant with two 3500 horsepower engines could therefore be installed in the *Vesuvius*, weighing only 210,000 pounds.

5. The advantages of such a plant over the one now in that vessel may best be considered by taking up in succession the different elements that combine to make up the efficiency of torpedo-boats or vessels of war, and show to what extent they would be affected by such a change:

(a) *Speed of the vessel.*—Changing the horsepower from 3774 to 7000, without even considering the gain in weight, would make a marked increase in the speed of the *Vesuvius*.

(b) *Efficiency of the crew.*

(c) *Reliability of the torpedo.*—These would not be affected and so need not be considered.

(d) *Radius of action.*—The weight saved by the use of gas engines, amounting to 393,380 pounds, or 175 tons, admits of great increase in the coal capacity, but without regard to the weight the radius of action would be increased from 2½ to 3 times by converting the coal into gas, as with it 1 horsepower can be developed with 1 pound of coal, while with marine steam plants 1 horsepower obtained from 2½ pounds of coal is considered an excellent result. Not only can a poor quality of coal be used in the producers of gas plants, but even charcoal, peat, and wood have given good results.

(e) *Seaworthiness.*—This depends to a large extent upon the structural strength of the vessel. In the construction of torpedo-boats, weight has to be minimized to such an extent that very little is allowed for extraordinary strains, and owing to this sacrifice of strength, torpedo-boats have been known to break their backs in a heavy sea. The gain in the weight of machinery by the use of gas engines could be placed to great advantage in the hull, and thus increase the vessel's seaworthiness.

(f) *Ability to take fuel on board in a sea way.*—The efficiency of torpedo-boats is materially increased if they can obtain fuel from a supply ship, without having to seek the shelter of a port, and this method of supply becomes essential when operating near an enemy's country. Oil can be transferred from one vessel to another in a sea way by means of a hose without danger to either, while coaling under such conditions is practically impossible.

(g) *Ability to obtain a high speed without being seen by the enemy at night.*—The primary object of a torpedo-boat is to attack the enemy's vessels at night. To make this attack effective it is necessary to get near the enemy before being discovered. This means a high speed and that nothing should show to attract the enemy's attention. It is almost impossible to force a torpedo-boat to its maximum speed, at night, without showing a glare from the top of the stacks. To steam at less than maximum speed means that the chances of detection are greater and the vessel will be under fire longer before she can discharge her torpedo. Even then a careless fireman may handle his fires so as to cause a glare and turn a well-planned attack into disaster. With gas engines no smoke stacks are required at any time.

(h) *Ability to see the enemy's large vessels in the day time without being seen.*—Torpedo-boats on scout duty, fitted with gas plants, and therefore showing no smoke, could, as a rule, approach near enough to make out an enemy's vessel without herself being discovered and then return to give information to the parent squadron.

(i) *Ability to get under way quickly without constantly carrying a full head of steam.*—A coal gas producer can be kept lighted, consuming less than 100 pounds a day when not in use, and the engine attached can be started and obtain its maximum speed almost immediately. To be able to do this with a steam engine the boiler pressures must be kept up to a maximum constantly.

(j) *The utilization, for the fighting force, of as many of the small complement as possible.*—Owing to the absence of fires to work, the smaller quantity of coal used for the same horsepower, and the absence of air, circulating, and feed pumps, and condensers in gas engines, the engineer's force can be reduced almost one-half, thus permitting of a larger fighting force to be carried.

(k) *Liability of the machinery to break down.*—Small factor of safety and an extensive plant, the whole of which being required to stand the maximum pressure, is the cause of most of the accidents on torpedo-boats. In gas engine plants the cylinders alone have to stand the maximum pressure and a large factor of safety can be used in the construction of the engine.

6. Any kind of fuel can be used in an explosive engine. Kerosene is the least dangerous, to have on board ship, of all oils that can be obtained in quantities. This oil can be used directly in the engine, doing away with the necessity of a producer, and gives 25 per cent more power than a coal gas engine of the same dimensions.

7. The saving of space and weight would be very great, and they are especially adaptable to the launches supplied to vessels of the service.

8. Though the above discussion refers to torpedo-boats, gas engines can be installed in all classes of vessels.

9. I have thus, as briefly as possible, presented some of the arguments which have occurred to me in favor of gas and oil engines, but I am prepared to present data bearing on this subject, which seems to me to be of vital interest to the navy, for the consideration of a board of officers, or in such other manner as the Department may deem best.

10. The explosive marine engine plants in this country are young and small, and they are not in a position to build large engines unless there is a demand for them. All of the large shipbuilding companies are building steam engines, and will continue to do so as long as they can. Outside of the navy, very little building of large vessels is going on. If gas engines are better than steam, surely all vessels to be appropriated for should not be fitted with the latter.

Very respectfully,

(Signed) A. T. CHESTER,
Lieutenant, U. S. Navy.

THE SECRETARY OF THE NAVY,
NAVY DEPARTMENT, WASHINGTON, D. C.

Up to the date of Mr. Chester's letter but little had been published in the United States concerning marine gas engines, and the brief report of this officer might be said to relate to the subject in general, whether as applied to the navy or the commerce of the country. The then Secretary of the Navy, Hon. Paul Morton, said, upon receiving the report, that he was a strong believer in liquid fuel and that he favored the scheme presented to him, and would do all he could to have the navy

take up the matter; but he soon thereafter resigned his position in the cabinet and the subject was dropped.

Mr. Chester also informed the Secretary, orally, that the proposed change of motive power for the navy which he advocated, while it might in the end cover every class of vessel propelled by steam, was particularly applicable to the smaller vessels of the service, as there were many types of low-powered engines in the market, while the higher powered machines were still in an experimental stage.

He called attention to the fact that the navy was then building steam launches of 60 feet length, which, in order to obtain a moderate 52 horsepower, required machinery weighing 7½ tons, and that the machinery so completely filled the launches (which were about the largest sized boat that could be carried on board ship) as to prevent more than 8 to 10 men getting into them, and thus making them useless as life savers; that the total weight of the boat was so great as to make it dangerous to put them overboard except under the most favorable circumstances, and that when afloat so much time would be consumed in getting up steam as to make the boats inoperative for immediate service, even if that service could be anticipated.

In contrast to this, it was stated that a 75-horsepower gas plant could be installed in this same launch, giving more speed, and which would weigh altogether only about 1800 pounds as against the 7½ tons of the steam plant, and that the gas installation would occupy a space only about one-half as great as that for steam.

These figures show in a marked manner the enormous saving in weight of the machinery alone in using a gas plant for motive power and of course the boat itself can be built of proportionately lighter material to meet the new conditions.

A prominent naval constructor stated about this time, when questioned concerning steam launches, "Why, in five years there will not be a steam launch in the navy, and if we had time to take up the subject of gas engines now the change would come about very soon."

Almost every navy in Europe has given encouragement, at least, to the experiments that have gone on abroad during the past two years in the development of motor engines, and while the ground covered has scarcely been scratched, the more the subject is studied the greater seem its possibilities.

Men of high standing in marine construction have spoken strongly of the advantages of using gas as the motive power for vessels, and especially naval vessels. Such an authority as Sir William White, formerly chief constructor of the British Navy, recently stated that "gas engines will be bound to play a most important part in marine engineering."

To such testimony may be added the weighty opinion of Mr. Arthur Lee, M. P., the Civil Lord of the Admiralty, who, in replying a short time since in England to a toast, "The Navy," observed that "there was one direction in which the motor engineer could render a service to the British Navy. If he could design a heavy oil engine, capable of being easily started, readily reversible, without the intervention of compressed air if possible, fairly silent, and of from 50 to 300 H. P. the Admiralty would gladly build from the designs for auxiliary craft picket boats and launches; and if it were possible to place such motors to give from 7000 to 30,000 H. P., so that they could take the place of destroyer engines, the navy would be willing to abandon steam forever in this connection. The saving would be immense, the sum of a million pounds sterling being now annually expended in stokers' wages alone." (Query, What would be the proportionate saving to the navy of the United States where the wages are so much higher than in England?)

Sir Charles Campbell, rear-admiral of the British Navy, read a paper recently before the Royal United Service Institution in which he indulged in some interesting speculations of the naval operations of the future. Among other things, he stated that "he hoped and believed that it would be possible, before long, to do away with funnels which were quite as sinful to-day as sails were twenty years ago." He predicted that "internal combustion engines, oil, gas, or chemical, would eventually become the motive power for the purposes of commerce and war."

One of the most progressive captains of the British Mediterranean fleet told the writer last summer that he was afraid the craze for turbine battleships would cause a number of them to be built for the British Navy, while we Americans would rapidly develop motor engines for our battleships, to the betterment of our navy and to the injury of their own.

While the conditions regulating marine motors requiring a great number of revolutions of the engine are quite different from

those for land service, the already largely increased size of marine motors which have been built indicate that the limits given by the Civil Lord of the British Admiralty will soon be within the grasp of the motor engineer. Indeed, it is said that in Germany, where much thought has been given to motor construction, 5000 H. P. engines are now under way, but as no one is willing to give out the result of investigation upon which patent rights may be claimed it is difficult to learn just what has been done in the matter.

The writer has recently inspected a 3000 H. P. four-cycle gas engine near completion at the Westinghouse works of Pittsburg, Pa. So it may be said this country is well to the forefront in building high-powered motor engines. To be sure our countrymen have as yet produced high-power gas engines for land service only, for the reason that but little demand has arisen for this class of machinery except from the amateur sailor who seeks only the speed for his small boat that the use of gas will give him.

The shipbuilding companies of this country are mostly now struggling for an existence, owing to there being but little demand for new ships except from the government, and they are loath to take up a new scheme which still requires an amount of investigation which they cannot afford to give. In Europe, however, and particularly in England, the conditions are different. There shipbuilding establishments are financially stronger and they are giving more time to the investigation of this important subject, and are spending large amounts of money in developing a system that all recognize is to be the motive power for vessels. We are reaping the benefits of this experimentation.

In a recent article published by Mr. J. E. Thornycroft, of the celebrated establishment in England which bears his name, he stated that "the subject of gas engines for ship propulsion was first discussed at the spring meeting of the Institute of Naval Architects in 1904, and that there was practically no information on the subject available at that time."

I should like here to note that Mr. Chester's paper heretofore given was prepared at about this time and was presented to the department only a few months later, viz., November 26, 1904.

Continuing, Mr. Thornycroft said that "the only kind of engines as yet built for marine purposes are those working on the 'Otto' cycle principles, which requires no special gas or air

THORNYCROFT 40-FT. TORPEDO LAUNCH. WEIGHT, 4½ TONS.

pumps. For moderate powers a single-acting engine with trunk piston is the most convenient, as the piston does not require to be water-cooled until one as much as about 2 feet in diameter is employed. A single cylinder 20 inches diameter by 2 feet stroke running at 120 revolutions per minute will give 100 H. P., taking the average working pressure at about 80, which is less than figures often obtained. The same size cylinder working as a double-acting cylinder would double the horsepower. The average heat efficiency of steam boilers is taken at about 66 per cent."

Mr. Thornycroft quotes Professor Copper as stating that "the thermal maximum efficiency of steam engines is only about 30 per cent and that only 5 to 20 per cent of heat generated is turned into useful work." The same authority states that "in gas engines the theoretical efficiency is about 80 per cent and in practice 25 to 30 per cent of heat developed in the cylinder is turned into useful work."

"For vessels with small compound condensing engines of less than 100 H. P. the fuel consumption ranges from 2 to 3 pounds per horsepower. For gas engines of this power the fuel consumption is less than 1 pound per horsepower. For larger powers of not less than 500 H. P. the economy is not quite so marked, but will be about as follows: Steam plant, say, 1.6 per I. H. P.; gas plant, 0.8 per I. H. P. At this figure of one-half the gas plant is worthy of adoption, as the same coal will do double the work."

The comparison between gas and steam taken from the Thornycroft report are surely conservative values, and I believe better results from the gas engines have been obtained in this country.

While on the subject of economy of fuel, I might quote also another excellent authority who states that the ordinary waste of coal in running a steam plant during lay-by hours reaches sometimes as high as 40 per cent of the coal consumed. It seems reasonable to presume this figure is exceeded in our navy owing to the length of time our ships lie under banked fires.

In England, several tugs, boats, and other vessels have been fitted with explosive engines, and one of the best tests of their efficiency as compared with steam propulsion is given as follows:

November 8, 1904—A test run took place between *Gastug No. 1* and *Elfriede*, a steam tug of very nearly the same dimensions and power. *Gastug* 44 feet 3 inches long by 10 feet 6 inches beam, fitted with a four-cylinder 70 H. P. suction gas plant.

Elfriede 47 feet long by 12 feet beam, with a 75 H. P. steam plant. At the towing meter *Gastug's* maximum pull was 2140 pounds, *Elfriede* 2020 pounds. The tugs ran from Hamburg to Kiel and back during stormy weather at a maintained speed of 8½ knots. The consumption of fuel for *Gastug* was 530 pounds German anthracite coal, while the *Elfriede* consumed 1820 pounds steam coal. This shows economy of 1 to 3.44 in favor of gas plant.

The French have made a number of motor boats for their navy and recently issued conditions for a competition for naval service boats propelled by internal combustion engines. The boats must be about 60 feet long, speed 12 knots, and engines of kerosene type to be supplied by the French government.

The Russian government has many internal combustion engined boats in its service which have been built in England and the United States. They also have several boats built by Belguim, French, and German firms.

In Germany, motor boats have been employed at navy yards for some time and others are now being rapidly built for the fleet to replace the 16-meter steam launches, which weigh about 20 tons. The new boats will weigh less than half that amount.

"The Societa Anonima perda Construzione di Autoschafi of Spectcia, Italy, have just completed a motor pinnace for the Italian Navy Department which is 36 feet long, 7.7 feet wide, 219 feet draft, and is equipped with two 60 H. P. F. I. A. T. kerosene motors with separate propellers, with a displacement of 6¼ tons. This boat has attained a speed of 17 nautical miles per hour and has proved so successful that the Italian Navy Department has placed an order for a similar boat 40.19 feet long which will be equipped with two specially made torpedo tubes of their own design, while the smaller boat will be adopted as a part of the regular equipment of the Italian war vessels." (From the magazine, *The Motor Boat,* June 10, 1904.)

No one can tell as yet what impetus will be given to motor-boat construction in this country by the recently enacted law of Congress relieving denaturized alcohol from taxation. It is, however, certain that the use of alcohol as a fuel will be of inestimable advantage to the navy, for by its use we at once do away with the objections that are made to the use of most forms of oil. It may be said in passing that the danger of

carrying oil in our ships is greatly overestimated, for, if rightly handled, most of its by-products are safer than much of the bituminous coal that has on repeated occasions nearly wrecked some of our ships.

As the navy is now using at the rate of $1,500,000 worth of alcohol annually, as stated by an excellent authority, the charge of "unsafe" cannot be made against it. As for carrying alcohol in our ships in large quantities it is suggested that the trimming tanks which are usually filled with salt water might be made receptacles for this class of supplies. The alcohol could be readily transferred, by means of pipes, from one end of the ship to the other as occasion required, taking the place of the salt-water ballast. This arrangement would at the same time overcome the objection to carrying unnecessary weights in the ship. Should alcohol not come into common use at once as fuel, kerosene can well take its place until it becomes available.

But whatever character of fuel is adopted as a substitute, we should at once and forever discard the use of coal for the motive power of our small vessels, and by so doing we shall prepare our people for conditions that must soon come for larger craft. Coal will, of course, be mainly used for the larger vessels for some time, yet the great advantages to be derived from liquid fuel will cause it to be used in connection with, if not in substitution for, the less efficient power maker.

Our policy has been in the past to begin a new departure in construction by building small vessels first, and, as the service grows and our men become more proficient in the art of construction, to gradually increase the tonnage of ships until, as at present, for example, we have the 20,000-ton battleship for which Congress has appropriated money. Unquestionably this policy is sound in principle and is safe to follow in motor-boat construction, but that we should make a beginning in the development of this important work that no one else will do for us without governmental aid goes without saying.

With the idea of creating a sentiment that shall encourage outside parties to experiment in this class of construction, I desire to call the attention of the Institute to recent developments regarding second-class torpedo-boats. The most of us recall the lamentable failure we made in building this type of boat for the first-class battleship *Maine*. The boats were intended to be car-

ried on the ship, but never got on board and finally went into the scrap heap. The usual compromise between size, speed capacity, and weight made them worthless as ships running boats, or as cruisers. Now as we have the means of doubling the power and halving the weights by the use of explosive engines, and have many motor boats which the yachtsmen of the country have given us from which to obtain the data we need to study the subject to advantage, it is high time we reorganize our boat fleet.

There is already in the market a Thornycroft second-class torpedo-boat made in England to show the possibilities of the reorganized fleet. This boat is 40 feet long, 6.3 feet beam, and 2.4 feet draft, built of steel and powered with a Petrol motor engine which will give her 17 miles speed. She carries a 5-meter Whitehead torpedo and weighs only 4½ tons.[1]

Compare these figures with those for one of our 40-feet steam launches that weighs about 10 tons and can barely carry her own crew, to say nothing of a torpedo.

If it was desirable to provide the fleet with small torpedo-boats when the first *Maine* was built how much more important has it become now that the advance in the science of war as studied from the negative results of 1898 and from the more valuable experiences of the Russia-Japanese war have given us object-lessons well worthy of consideration. These certainly show that the torpedo will for some time to come continue to be an important adjunct to the battery of a ship, and also that much remains to be done before we shall obtain from this powerful machine all that it is capable of fulfilling.

Shall we then continue the policy of loading down our battleships with a large number of small boats which are to be left ashore when war comes, as was generally done during the Spanish-American war, rather than to keep them on board ship to be made into splinters with which to kill our own people, or shall we attempt to supply our new 20,000-ton battleship with a class of boat that can be used both in peace and in war?

Many people in the business world are now studying this subject with great interest and there is but little doubt that some good form of torpedo-boat will soon be developed that the ship

[1] The illustrations accompanying this article show two views of this boat. A Yarrow motor torpedo-boat is described on page 1149 of the PROCEEDINGS.

THORNYCROFT TORPEDO LAUNCH MACHINERY.

can carry at all times and be ready for use when the emergency arises. It is safe to say that a boat can be constructed under the new conditions that will make at least 20 knots an hour carrying a 15-foot torpedo and that will not weigh more than our 40-foot steam launches do at the present time.

By equipping each of our battleships with say four or six such boats that may be dropped overboard just before battle begins, to act as a separate organization, we will have a fleet of torpedo-boats that can take advantage of any tactical movement we or our enemies may make and thus greatly strengthen the fighting power of our fleet.

But if they subserve no other purpose such a squadron of boats acting from under the lee of the parent ships may be most effective in giving aid to ships or people in distress during battle.

With such an adjunct to our fleet as herein proposed, is not that perplexing question of under-water or over-water torpedo tubes solved?

If we are to get from the large sum of money that Congress has authorized for the new battleship appropriated for in 1906 all that she is to cost, I believe we should take advantage of the great saving in weights and the fast speed that explosive engines give us to build boats that shall themselves be of fighting value to our fleet, rather than have our ships carry a mass of material that will be a menace to the lives of our men in time of battle.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE HORIZOMETER.

By COMMANDER BRADLEY A. FISKE, U. S. Navy.

This is an instrument of my invention by which the distance of an object at sea can be measured by measuring the angle of depression of its water-line below a horizontal line, drawn from the eye of the observer. The instrument is "set" at the height of the observer, and the measurement is made by turning a micrometer wheel, graduated in yards, until the image of the water-line of the object is raised through the angle of depression; and then reading the graduation on the micrometer wheel.

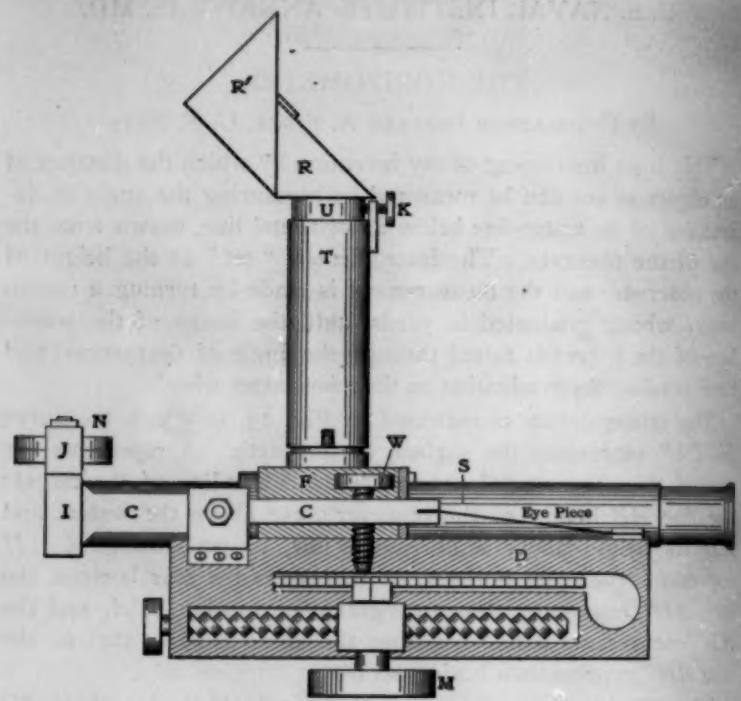
The triangulation is indicated in Fig. 13, in which the curve *HCDH'* represents the surface of the earth. *A* represents the eye of the observer; *C* represents the water-line of the target; the line *AB* height of the observer's eye above the water; and *AD* its height above a horizontal line, drawn through *C*. *H* represents the front horizon, *H'* represents the rear horizon, the line *AH"* represents the prolongation of the line *H'A*, and the *AH"'* represents a line bisecting the angle *H"AH;* that is, the line *AH"'* represents a horizontal line.

The triangle *ACD*, being a right triangle, if the length of *AD* and the angle *ACD* are known, we can find the distance *AC*. Furthermore, if an observer were at *C* with a stadimeter, "set" at the height *AD*, and if he alined *A* and *D*, he could read the distance *AC*, on the micrometer wheel.

But the angle *ACD* is equal to the angle *CAH"'*; therefore, if an observer were at *A*, and set his stadimeter at the height *AD*, and *could* aline the water-line *C* with the line *H"'*, he could also read the distance *AC* on the micrometer wheel. It is this alinement which the horizometer accomplishes.

The construction of the horizometer is indicated in the sketch. It will be seen that it consists of a stadimeter frame, *D*, on which is secured a peculiar telescope. This telescope consists of an eye-piece and two object glasses, whose planes are at right angles to

each other. One glass is in front of the eye-piece, in the frame *I*, while the other glass is above it and at right angles to it, in the tube *T*. Mounted above the upper object glass is a prism, *R*, turned to the front. This prism receives rays of light and re-



THE HORIZOMETER.

flects them down through the upper object glass to a small prism in the box *F*, which reflects them back into the eye-piece. This small prism, however, occupies only one-half of the field of the eye-piece; so that the eye-piece receives, not only the rays which come down from the prism *R*, but also the rays which come direct from the front object glass. The result is that the observer sees two distinct pictures; one picture occupying the left half of the field, and the other picture occupying the right half of the field, (see Figs. 1 to 10). In the present instrument, the rays which come down from the prism form the left picture, while the rays which come from the front object glass form the right picture. The focus of the upper object glass is in the rear face of the small

FIG. 1. FIG. 2. FIG. 3. FIG. 4.

FIG. 5. FIG. 6. FIG. 7. FIG. 8.

FIG. 9. FIG. 10. FIG. 11.

FIG. 12.

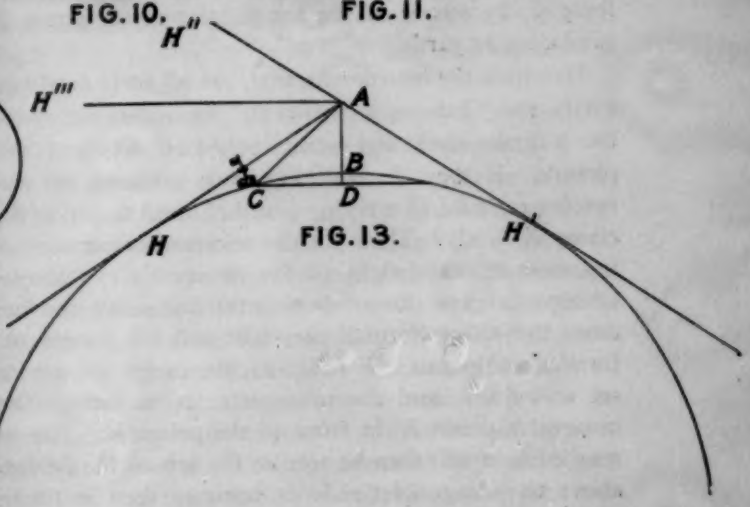


FIG. 13.

prism; and the focus of the front object glass is in the prolongation of the plane of the rear face of the small prism; the eye-piece is adjusted by the observer to get the clearest vision of the two images and the rear face of the small prism. This small prism is secured rigidly to a prolongation of the eye-piece-tube, and can be withdrawn to the rear from box *F* by unscrewing the four screws which attach the eye-piece-tube to box *F*.

The front object glass is not held rigidly on the tube in front of the eye-piece, but is held in a frame *I*, which is mounted on the pivoted bar *C*, which pivoted bar can be moved up or down by means of the micrometer screw *M*, or the adjusting screw *W*. If the front object glass be raised, its focus rises with it; so that the image formed on its focal plane seems to *fall*, as viewed through the inverting eye-piece. Therefore, if the two images of a distant object—say the horizon—do not form a continuous straight line, they can be made to do so, by raising or lowering the front object glass. For instance, if the right image of the horizon is lower than the left image (Fig. 1) the front object glass must be *lowered*. This can be done in three ways: First, by raising the rear end of the lever *C* (which carries the frame *I* holding the object glass), by means of the adjusting screw *W*; second, by lowering the object glass in its frame *I* by means of the micrometer screw *N*; and third, by raising the rear end of the lever *C*, by means of the range micrometer screw *M*, which is graduated in yards.

To adjust the instrument, first, *see all parts firmly in place*, then verify the "halving adjustment," by observing a distant object, like a smoke-stack, and seeing if the two pictures form one correct picture. If they do not (Fig. 11), unclamp the screw *K*, and revolve the tube *U* carrying prism *R*, until they do (Fig. 12), then clamp *K* firmly. Then put the micrometer carriage at the height representing the height of the observer's eye above the water. Observe a very distant horizontal line,—say the horizon,—and move the screw *W* until the right and left images of this object form a continuous line (Fig. 2), the range micrometer *M*, being set at infinity, and the micrometer *N* at zero. Then ship the removable prism *R'* in front of the prism *R*. The image of the rear horizon will then be seen in the left of the field, considerably above the image of the front horizon, seen in the right of the field (Fig. 3). Move the micrometer *N*, and thus raise the front

horizon, until both horizons are alined (Fig. 4). Under normal conditions of the atmosphere, the micrometer *N* will then indicate about 70, if the eye-piece of the instrument is about 80 feet above the water, as will be the case in the upper foretop of a battleship. Move the micrometer *N* to *half* the amount through which it has been moved; say to 35. The image of the front horizon will then be in a true horizontal line from the eye of the observer (Fig. 5). Then turn the instrument towards the target, estimate its distance, add to the height above the water the number of feet shown in the following table, and set the instrument at that height. For instance, if the instrument be set at 80 feet, and the estimated distance is 6000 yards, set the instrument at 86.7 feet.

Distance Yards.	Additional Height in Feet.	Distance Yards.	Additional Height in Feet.
2,000	.75	6,500	7.9
2,500	1.2	7,000	9.1
3,000	1.7	7,500	10.5
3,500	2.3	8,000	11.9
4,000	3.0	8,500	13.3
4,500	3.8	9,000	15.1
5,000	4.7	9,500	16.8
5,500	5.6	10,000	18.6
6,000	6.7		

It is well, now, as a matter of precaution, if a careful measurement is to be taken, to "verify the zero" by taking off the removable prism, and seeing if the two images of the front horizon are still alined; if not, move *W* until they are, and replace the movable prism.

The instrument is now ready. *The adjustments just described can be made in less than 30 seconds, after a little practice.*

To measure the distance, move the range micrometer *M* until the water-line of the target is alined with the rear horizon (Fig. 6). This movement raises the water-line through an angle equal to the true dip of the horizon, plus the angle between the horizon and the water-line; that is, it raises the water-line through its angle of depression below the horizontal. In case the distance measured shows the estimated distance to be considerably in error, the setting for height will have to be rectified. For instance, if the distance be found to be 7000 yards instead of 6000 the instrument must be set at 89.1 feet instead of 86.7, and a new measurement taken. If the distance change thereafter, the setting for height will have to be changed. This can be done in a

few seconds; and as the amount of change will be very small, it will not be necessary to "verify the zero."

In case the target be to seaward, and the *rear* horizon, while the instrument is pointed at the target, cannot be seen, take off the removable prism R', and set the object glass micrometer N to the same graduation on the *opposite side of zero* on its scale, say to minus 35, and proceed as before. The operation is the same, though the theory is a little different. With the range micrometer at infinity, the left *front* horizon will be *below* the horizontal by the amount of the dip, and the right horizon by twice the dip (Fig. 7), so that the angle between them will be the true dip; and by raising the water-line of the target into alinement with the left horizon, the water-line will be raised through its angle of depression, just as it was when using the rear horizon (Fig. 8).

To use the instrument for spotting at target practice, set the range micrometer M at the distance of the target, and move the object glass micrometer N until the right and left images of the water-line (Fig. 9) form a straight line. Then raise the image of the splash until the splash is alined with the left image of the water-line, and see how far the micrometer has moved. For instance, if the target is 6000 yards distant, and the micrometer shows 5500 yards when the splash is alined, the shot went 500 yards short of the water-line (Fig. 10). It will be noted that this plan of alining the splash with the water-line is an endeavor to substitute an instrumental measurement for the process of "estimating," now used in vertical spotting. *In strictness,* the instrument should be set first at the height for 6000 and afterwards for the estimated distance of the splash. But when the distances are so close together as those of a splash worth spotting and its target, the error resulting from using the same height setting for both is inappreciable.

The instrument can be used as a stadimeter, in the sense that it can be adjusted at the known height of any object, and the distance of that object then measured, by alining the direct and reflected images of its top and bottom. It differs from the stadimeter in the method of construction and the optical principal used. One difference is that the alining of the direct and reflected images is not done by rotating a mirror, but moving bodily, parallel to itself, the object glass of the telescope through which the object is viewed.

Another difference is that prisms are used instead of mirrors. There can be no doubt that prisms are better, because they are more durable, can be more rigidly secured, and can be easily wiped off in case moisture is deposited on them. In the horizometer, there are only two surfaces on which moisture can be deposited—one surface of an object glass, and one surface of a prism; whereas, in the stadimeter, there are four surfaces—one side of the index glass, two sides of the horizon glass, and one side of the object glass of the telescope. Another difference is the arrangement (screw *W*) for adjusting, which is quicker and more positive than in the ordinary stadimeter. This is an important point; because, with the ordinary stadimeter, when changing from one mast height to another, especially if the instrument be not altogether new, the adjustment for zero is nearly always thrown out, making it necessary to readjust if accurate work is needed. While this is not needed under ordinary conditions, it would be needed when using the stadimeter as a range finder at long distances; and the difficulty and delay caused would make this operation disadvantageous in battle. With the horizometer, the readjustment can be made in two seconds, by moving the screw *W*.

Another difference is the larger and clearer field of view. The field is a little more than 5°.

Another difference is that a vertical line runs down the middle of the field, which enables the observer to tell when his instrument is pointed exactly at an object.

Another difference is that the instrument is mounted like a pelorus on a firm pedestal; and, for this reason, it can be made more rugged than the ordinary stadimeter, which is intended to be held in the hand. The necessity for making the ordinary stadimeter light and portable makes it very susceptible to disadjustment and injury. The horizometer, if properly mounted and covered, would seem to be almost indestructible. Furthermore, the observer can determine not only the distance of any object, but also its direction, referred to the keel line of the ship; and also its compass bearing.

In order to test the comparative accuracy of the stadimeter and the horizometer, used as a stadimeter, I had a competitive test made on board the *Minneapolis* at Tompkinsville, on August 6, 1906.

The result is shown in the following tables.

The object observed was the Statue of Liberty, and the height to which the horizometer was set was 151½ feet, the distance from the top of the torch to the bottom of the statue itself (not the pedestal).

The conditions for seeing were far from good. The upper part of the arm could not be distinguished at all with the naked eye. The air was very hazy, and there was a great deal of smoke. I doubt if an observer using an ordinary reflecting range finder could have seen the object clearly enough to have measured the distance. The bottom of the statue which was alined with the top of the torch, was especially dim: very different from the sharp water line of a ship going fast through the water, caused by the foam.

The position of the ship was very carefully plotted on the chart. The distance of its position from the Statue of Liberty was measured on the chart with great care, and found to be 6397 yards.

Neither of the observers knew the distance, except approximately. When using the stadimeter, they sat down and took the observations very carefully.

The stadimeter was No. 308, a new one, issued by the Bureau of Equipment. While the scale was harder to read than those with graduations farther apart, supplied by the Bureau of Ordnance, the errors in reading caused by the closeness of the graduations were not enough to affect practically the results.

The first observations were taken by Midshipman Alexander Sharp, Jr. The results are shown below. The observations with the horizometer were made more rapidly than with the stadimeter:

MINNEAPOLIS ANCHORED OFF TOMPKINSVILLE, S. I.

OBJECT OBSERVED—STATUE OF LIBERTY.

True Distance 6397 Yards.

	Distance by Horizometer.	Error.	Distance by Stadimeter.	Error.
1	6,300 Yards.	97 Yards.	6,800 Yards.	403 Yards.
2	6,325 "	62 "	6,700 "	303 "
3	6,300 "	97 "	6,750 "	353 "
4	6,300 "	97 "	6,750 "	353 "
5	6,300 "	97 "	6,300 "	97 "
6	6,300 "	97 "	6,400 "	3 "
7	6,300 "	97 "	6,230 "	167 "
8	6,350 "	47 "	6,300 "	97 "
9	6,400 "	3 "	6,300 "	97 "
10	6,300 "	97 "	6,400 "	3 "
	Average error 79.1 yards.		Average error 187.6 yards.	

Mr. Sharp was much dissatisfied with his observations with the stadimeter, and asked to take ten more. He did so, and the results were as follows:

	Distance by Stadimeter.	Error.		Distance by Stadimeter.	Error.
1	6,400 Yards.	3 Yards.	6	6,800 Yards.	403 Yards.
2	6,800 "	403 "	7	6,600 "	203 "
3	6,850 "	453 "	8	6,600 "	203 "
4	6,300 "	97 "	9	6,600 "	203 "
5	6,600 "	203 "	10	6,550 "	103 "

Average error 227.4 yards.

The following observations were then made by Midshipman W. H. Stevenson:

	Distance by Horizometer.	Error.	Distance by Stadimeter.	Error.
1	6,450 Yards.	53 Yards.	6,400 Yards.	3 Yards.
2	6,400 "	3 "	6,400 "	3 "
3	6,325 "	62 "	6,500 "	103 "
4	6,400 "	3 "	6,300 "	97 "
5	6,300 "	97 "	6,800 "	403 "
6	6,350 "	47 "	6,800 "	403 "
7	6,425 "	28 "	6,700 "	303 "
8	6,325 "	62 "	6,900 "	503 "
9	6,400 "	3 "	6,600 "	203 "
10	6,400 "	3 "	6,400 "	3 "
	Average error 36.1 yards.		Average error 202.4 yards.	

These observations cannot properly be considered as showing the accuracy of either instrument, for the reason that the conditions were very unfavorable. But they do seem to show that the horizometer is a better stadimeter than the stadimeter is. The reason is that the images seen in the horizometer are much the clearer. An observer, when using the stadimeter, as when using the sextant, sees two images of the same thing superposed; and he moves the top of one image until it is superposed on the bottom of the other image. But in using the horizometer, he sees two wholly independent images, one on one side of the field and the other on the other side of the field; and he alines one image with the other. The optical principle of the horizometer seems better than the optical principle of the stadimeter, even for use as a stadimeter.

To use the horizometer as a stadimeter, set it at the mast height of the target and move the range micrometer *M* until the water-line is raised level with the top of a mast or smoke-stack.

In the opinion of the inventor, the principal use of this instrument, for battle purposes, would be in getting the approximate distance of an enemy's ship, and thereafter using it as a stadimeter, especially if the atmosphere is not very clear, and if the waves are as high as they usually are in deep water. *Under these conditions, which are normal conditions at sea, a distant ship looks dim; and an ordinary range finder shows an image more dim; so that even approximate ranges cannot be gotten; and the water is apt to be so covered with white caps, that spotting would be impossible.* But by alining the top of a smoke-stack with the water-line, a height, or base-line, of about 80 feet, can be gotten, and very clear images, even if the weather conditions are not very good; and the "setting" for the height can be altered by turning *Z* until the shots group properly about the target. The instrument may then be said to be set at the "virtual mast height," for getting the "sight-bar ranges."

When the First Division of the U. S. Atlantic Fleet was going up New York Bay on August 19, 1906, very clear observations up to 9700 yards were gotten by the horizometer on the *Minneapolis* at Tompkinsville, alining the top of the after smoke-stack of the *Maine* with her water-line, and using 80 feet as the estimated height. At 9700 yards, a tow got into the line of sight and stayed there.

In claiming a field of usefulness for this instrument, as employed in this way, and without detracting in the slightest from the value of spotting *in smooth water*, it may be pointed out that the theory of spotting pre-supposes that the sea is absolutely flat, the water-line of the target a straight line, and the free-board of the enemy's ship a constant quantity. But an extended series of observations at sea on a recent trip to Madeira, using the *Denver*, *Des Moines*, and *Cleveland* as targets, and using the horizometer as the observing instrument, showed that the mere height of the waves near the observed ship exercises a very disturbing influence on any attempt to estimate, or measure, the distance short of a ship that any point may be. The crest of a wave short of a distant ship is seen to be *above* her water-line, and not below it; so that a point on that wave, such as splash made by a shot striking it, would seem to fall short, and yet the shot might be a perfect one; one that would have hit the ship, if it had not hit the wave. Furthermore, the bow or stern, when a long ship is pitching only

a little, may rise and fall five feet each side of the horizontal; so that an absolutely perfect shot might go over it, or a poor shot might hit it. Any attempt to spot successive shots, and change the range by them under these conditions, *which are normal and not abnormal*, would produce confusion, and be impracticable.

A minor use of this instrument is as a short distance range finder, using as a base-line the distance, eight inches, between the top prism and the front object glass. By setting the instrument at 800 inches (66.6), a sufficient accuracy for some practical purposes can be gotten up to 500 yards. The operation is to set the range micrometer at infinity, aline the two images of the target by the screw *W*, aline the two images of the horizon by using the range micrometer *M*, and divide the indication by 100.

It may be proper to point out here a prevailing misconception regarding the accuracy of range finders. One often hears that such and such a range finder has such and such an error, say at 6000 yards, as if that error were a known quantity, like the error of a chronometer. It differs from the error of a chronometer in two ways:

(1) The "error" cannot properly be called an error, because it is really an uncertainty, and may be positive or negative; it may be positive at one observation, and negative at the next observation of the same thing, taken immediately afterwards.

(2) The error, or uncertainty, varies with the conditions, especially with the clearness of the air. The error, or uncertainty, usually quoted is, like the speed of a horse or a ship, that obtained under the very best conditions. This is proper, for the same reason that it is proper in getting the speed of a horse or a ship, and is because the very best conditions are the only standard conditions. But misty or smoky air or vibration will cut down the accuracy of range-finder observations just as much as a heavy head-sea will cut down the speed of a ship and just as uncertainly. The shorter the base line and the greater the magnification per diameter of object glass, the greater will, of course, be the increase of uncertainty made by unfavorable conditions.

It has been exceedingly difficult to get any means of testing this instrument even approximately as a "spotter." But while at Annapolis last May, I sent a steam launch several times to a position 300 yards short of the *Hartford*, which was 6900 yards

west of the *Minneapolis*, set the instrument at 6900 yards, and alined the water-line of the launch with the water-line of the *Hartford*. At this time the horizometer was on the forward bridge, where the height of the eye-piece was only 40 feet above the water. I never got time to make any observations except in the afternoon, when the black hull of the *Hartford* showed a very vague water-line in the shadow. Nevertheless, the observations always showed the shortage as between 100 and 300 yards. The water, of course, was smooth, which is necessary to accurate spotting of all kinds. This test showed accuracy only; not general practicability for spotting.

Later, I rigged a temporary platform on the foremast, where the height of the eye-piece was 74 feet above the water, and was able later to have the following observations taken:

OBSERVATIONS AT MADEIRA, JULY 5, 1906.

Using *back* and *front* horizons.

Horizometer on temporary platform on foremast of *Minneapolis:*

Height of eye above water, 74 feet.

Distance of Cape Garajao, 6600 yards.

Distance of Cruz Point, 3000 yards.

Several observations by Chief Quartermaster Freid, using the horizometer as a horizometer, gave the distance of Cruz Point always between 2950 and 3050 yards, and of Cape Garajao always between 6500 and 6800 yards. He did not know the true distances.

OBSERVATIONS AT HORTA, AZORES, JULY 10, 1906.

Rear horizon not available.

Instrument set at normal distance of front horizon, 15,000 yards by micrometer *N;* setting for mast height, mast height being "height above water," multiplied by 1.98. (See "Dip," Chauvenet's Astronomy, Vol. 2).

In setting instrument for *distance of target* use as "height" the height above water plus figure in preceding table.

No.	Time.	Distance by Horizometer from Ship to Steamer.	Distance by Stadimeter from Ship to Steamer.	Difference.	Difference per 100 yards.
1.	2:51	2525 yards.	2469 yards.	59 yards.	.90%
2.	3:02	3140 "	3000 "	140 "	1.55%
3.	3:10	3600 "	3575 "	25 "	.20%
4.	3:27	4250 "	0 "	0 "	0

Average per cent difference *per 1000* yards, .66%

The stadimeter was used in a steam launch by Midshipman Sharp. As the water was rough, and the boat was pitching and rolling a great deal, the use of the stadimeter was exceedingly difficult. For this reason, the readings of the horizometer were probably the more accurate. These observations showed that the horizometer would be very convenient in laying out targets and buoys at predetermined distances and in predetermined directions from ships.

OBSERVATIONS TO TEST HORIZOMETER FOR SPOTTING, HORTA, JULY 11, 1906.

Height of eye of observer, 74 feet.

Horizometer set at 8200 yards, the distance of shore line of Pico. The correct distance of shore line of Southern Magdalena Rock, in line from observer to Pico was 6686 yards.

Several observations by Commander Newton, Lieutenant-Commander Porter, Lieutenant-Commander Hough, and myself gave the distance of shore line of Magdalena as between 6500 and 6900 yards. The instrument was first set at the mast-height setting for the known distance of Pico, 8200 yards, the direct and reflected images of Pica alined by micrometer *N*, and then at the mast height for the estimated distance of Magdalena Rock. Then the shore line of Magdalena was alined with the shore line of Pico, by the range micrometer *M*. This use of the instrument with distances so far apart would be important in navigation only, and in getting distances not beyond 10,000 yards.

In fact, the instrument is not reliable beyond 10,000 yards except as a stadimeter, because of the great and uncertain additions to be made to the mast height.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

AN ANSWER TO CRITICISMS OF "THE ELEMENTS OF FLEET TACTICS."

By LIEUTENANT-COMMANDER A. P. NIBLACK, U. S. Navy.

Writing for the NAVAL INSTITUTE PROCEEDINGS has its tribulations. An article on tactics by the writer, under the title, "The Jane Naval War Game in the Scientific American," written at the request of the Secretary of the Naval Institute, was required by the Navy Department to be first submitted to it for consideration, and several paragraphs were officially stricken from it before it was allowed to appear. Subsequently an article by the writer, entitled "Colliers and Coaling Stations," reluctantly written at the request of the Secretary of the Institute, received the condemnation of the Department, and the writer was officially reprimanded. The next contribution of the writer to the pages of the PROCEEDINGS, "Operations of the Navy and Marine Corps in the Philippines," was expurgated by the Board of Control, and the part which expressed the writer's opinions on medals and letters of condemnation was not allowed to appear.

The essay on "The Elements of Fleet Tactics" was submitted to the Navy Department before it appeared in the NAVAL INSTITUTE PROCEEDINGS. The essay merely advocates the study of naval tactics on the basis of gun-fire diagrams, which diagrams the writer has previously published and are original.

In order to avoid official censure the "direct method" as given in the essay differs from that of the official book, and consequently several of the critics have carefully pointed out the errors of the essay, apparently much to their satisfaction as naval tacticians. The "special methods" shown in the diagram will not work as shown because they are merely a weak suggestion of a similar movement officially tried on the North Atlantic Station, and which the writer did not desire to infringe. A caution is inserted in the essay that the diagrams are not to be taken too

seriously, but several of the critics evidently only looked at the pictures and did not read the text.

For generous and appreciated criticism the comments of Captain Murdock are a model. No one in the navy is better qualified to point out the errors and shortcomings of the essay, but he accepts it for its good intentions and makes the lucid and superb remark, "Nothing will, I believe, be more potent in pricking bubbles and in sifting right ideas from wrong than the one principle, that the aim of battle tactics is to keep the guns of all your ships constantly bearing on the enemy."

Rear-Admiral Goodrich and Captain Murdock may well be taken in their broad-minded remarks as representing the attitude of the War College towards service interest in naval tactics, as the former has been President and the latter Chief of the War College Staff. Rear-Admiral Brownson, Commander Fiske, and others accept the writer's good intentions, but the comments of Commander Rush would appear to give the impression that there is a coterie of tactical experts somewhere, presumably "graduates" of the War College, to whom a simple elementary essay is offensive. He says, "Up-to-date theorists and students of naval battle tactics, who for years have *worked together in conference*, at a place and at times devoted to this study, have helped in a great degree to crystallize naval expert opinion, etc." What has been the result? Is the service at large any further along? Are these disciples of the pure cult, like the early Christians, concealed somewhere in subterranean passages, preserving the true faith? Are these vestal virgins in the temples, merely keeping alive the sacred flame, or does the naval expert opinion only "crystallize"?

Commander Rush is quite right. There is nothing *new* in the essay and the point of view *is* that of a decade ago. There is nothing new under the sun, and elements must seem stale to game-board experts, but every one is agreed, critics, essayists, and "conferees," that what is needed is to get some of these theories down to salt water. Of course some of these will get their feet wet and die prematurely, but it seems to be at least agreed that our naval tactics needs hydropathic treatment.

Like Commander Rush, the writer at one time believed that rectangular movements were the only ones permissible, but the real test of any maneuver is the least disturbance of gun-fire.

If a special method in a special case gives us this *desideratum* then everything else must give way to it. If our commanding officers do not care for these methods then get some new commanding officers, but use the methods.

Mere destructive criticism, such as that indulged in by Commander Rush, is harmful and in effect morally wrong; but if he or any other of his colleagues have concealed anywhere the things we are looking for let them produce them. It is cruel to open up such large vistas and then merely flash in the pan.

Captain Wainwright says he has not pointed out all the errors he *believes* to exist in the essay, but he makes it very clear that he is against it. He says: "I do not believe in trying battle tactics with steam launches or pulling boats, unless for the education of officers who are not attached to a battle fleet; and then they should only use evolutions that had been tried out in the fleet." A list of these evolutions which have been tried out in the fleet would be interesting. If none have been tried out it would seem that none could be tried with boats. Therefore, do *nothing*. Conversely, if the fleet does not try out evolutions then for the education of officers let us try battle tactics with steam launches or pulling boats. In other words, let us do *something*. There is the issue clearly defined. The game board is the "dotter" and the boat exercise the "Morris tube" of doing something in naval tactics.

If command and flag rank will interest itself in questions which really concern the higher grades, we will hear less of coming to command rank young, but where professional interest spends itself on questions of promotion by selection or who gets this or that assignment, or who is to retire, or how many vice-admirals we should have, it is no wonder that our tactical books remain primitive and antiquated. Is it not up to some one to do something? Who is sitting back?

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

A POWERFUL NAVY NOT DANGEROUS TO CIVIL LIBERTY.[1]

By REAR-ADMIRAL S. B. LUCE, U. S. Navy.

When the Congress of Paris of 1856 issued the famous declaration which abolished privateering, all the maritime countries of Europe, great and small, hastened to express their intention of adhering to the four principles contained in it. But the United States government, with more deliberation, and certainly with far greater wisdom, declined to enter into the compact unless the first principle of the declaration, to wit, "Privateering is and remains abolished," should be amended by adding, "And that the private property of the subjects, or citizens, of a belligerent on the high seas shall be exempted from seizure by public armed vessels of the other belligerent, except it be contraband." Otherwise, it was argued, the states which maintained small naval forces would be at the mercy of those which maintained large ones. The views of the United States government, as expressed by the Secretary of State, Mr. William L. Marcy, in his letter to the Count de Sartiges, under date of July 28, 1856, were so sound and logical that they at once received the commendation of some of the leading powers of Europe, notably that of Russia, and have been deemed by publicists generally as unanswerable. But this letter, admirable as it is as a whole, contains an expression so peculiarly calculated to mislead the casual reader as to require some notice at our hands. It is this expression, indeed, probably flung out in the heat of the moment, which forms the key to our present essay, to which the preceding remarks are merely prefatory.

Mr. Marcy says, "The United States consider powerful navies and large standing armies, as permanent establishments, to be detrimental to national prosperity and dangerous to civil liberty. The expense of keeping them up is burdensome to the people."

[1] Reprinted from the *United Service Review* of January, 1880.

While we agree entirely with the general idea that it is contrary to the policy of our government to maintain a naval force large in proportion to our great and rapidly-increasing population, and our vast interests in ocean commerce, yet we must take exception to the confusion of ideas contained in the sentence just quoted. Mr. Marcy evidently intended the adverbial phrase, "dangerous to civil liberty," to apply to the maintenance of "large standing armies as permanent establishments," and did not intend it to qualify the possession of "powerful navies."

Powerful navies are *not* dangerous to civil liberty. This may be proved by the testimony of all history, both ancient and modern. One of the earliest navies known to authentic history, and at the same time one of the most respectable for its size and power, was that of Athens. At the battle of Salamis it proved itself equal to the great strain put upon its patriotism and valor. But while that battle is still pointed to by the naval student as illustrating certain great principles in the science of war, the political lessons to be drawn from it are even more suggestive. Won mainly through the instrumentality of the middle and lower classes, the enormous political value of the democracy in the great commercial centers, like Athens, hitherto unappreciated, became at once apparent to all Greece. Hence Mr. Grote has well styled the Athenian Navy "The child and champion of Athenian democracy." It was the navy that, at one of the most important crises of her history, turned the tide in favor of the great democratic party in Athens; and it ever proved the bulwark of progress and civilization when threatened by the tyrants of the East. It was only when the virus of political corruption had eaten into the heart of the state itself that it found its way into the last stronghold of patriotism,—the fleet; and when that fell, Athens and her pristine glory fell with it! No people of antiquity were more jealous of their liberties than the Athenians, and yet we read in the speeches of Pericles nothing but words of gratulation in regard to the power and achievements of their fleet.

The sailor has always been true and loyal. When Cambyses resolved to make war upon Carthage, the Phœnicians, who formed the strength of his fleet, refused to serve against their countrymen, thus compelling that great prince to abandon his design. While in the meridian of her power, the republic of Carthage maintained the most numerous fleets then known, and she con-

tinued to flourish until those fleets were overcome by the rising naval power of Rome. As soon as these faithful guardians of her shores were vanquished, Carthage herself succumbed to the legions of Rome.

"The Roman fleet," says Mommsen, speaking of republican Rome, "with its unwieldy grandeur, was the noblest creation of genius in this war,"—the first Punic; and as at its beginning, so also at its close it was the navy that inclined the great issues of war in favor of democratic Rome. After the fleet of Mark Antony had been annihilated at Actium the naval forces of Rome were largely increased, but it would be difficult to find a single indication of jealousy of its great power on the part of the people.

The navies of antiquity are especially cited, for the reason that no very broad line of demarcation separated, in those early days, the land army from the sea army. Thus Miltiades, the hero of Marathon, subsequently commanded the Greek fleet; and Pausanias, who defeated the Persians at Platæa, afterwards commanded as admiral in the Hellespont. Aristides, Alcibiades, Cimon, and many other distinguished Greeks, fought with marked ability both on shore and afloat, as did also the great Carthaginian and Roman leaders. If, then, a powerful fleet is dangerous to civil liberty, some proof, however slight, would surely be furnished by the history of republics at a period when the distinction between the two forces was so faintly defined. But the example is wanting of a navy of antiquity subverting the supreme power of the state.

The same may be predicated of the navies of the Middle Ages and of modern times. Coligny, admiral of France in 1552, had been a colonel of infantry, and had distinguished himself as a soldier. Blake, Popham, and Deane, three colonels of the army, subsequently held commands in the English fleet as flag-officers. The Duke of York, afterwards James II, received a military training under Turenne, and served with distinction in the campaigns in France and Spain, yet he afterwards commanded the fleet of England with remarkable success. As lord high admiral he had absolute control of the entire naval force of England, yet no history of that time contains a hint that he wielded a dangerous power by virtue of his high office. From the time of King John and Magna Charta, even during periods when Englishmen have been most sensitive in regard to their civil liberties, they have

continued steadily and surely to foster and increase their naval power.

Sir William Blackstone calls the navy of England the floating bulwark of the island; "an army," he says, "from which, however strong and powerful, no danger can ever be apprehended to liberty; and accordingly, it has ever been assiduously cultivated, even from the earliest ages." This opinion is re-echoed by Baron Macaulay. Referring to the time of Charles II, he says, "If the jealousy of the Parliament and of the nation made it impossible for the king to maintain a formidable standing army, no similar impediment prevented him from making England the first maritime power. Both Whigs and Tories were ready to applaud every step tending to increase the efficiency of that force, which, while it was the best protection of the island against foreign enemies, was powerless against civil liberty. Ever since the Restoration, the Commons, even when most discontented and most parsimonious, had always been bountiful even to profusion where the interests of the navy were concerned."

As the art of navigation improved, and commerce spread itself more and more to distant seas, the navy gradually assumed the importance of a distinct profession. Officers and seamen were now reared from their tenderest years to the privations of ship-life and the perils of the sea. Long and arduous voyages softened every recollection of home, and their return found them with an increased devotion to their native land. Hence, from the very nature of his calling, the seaman, far removed from civil strife, learned more thoroughly than any other class of citizens to revere the flag under which he sailed, and to which he proudly pointed in distant seas as the symbol of his native land. Whatever apprehensions of danger, therefore, may have existed under the old system, they must certainly have disappeared under the new.

The great Admiral Blake well expressed the sentiment natural to a navy when, after the death of Charles I, he said to his seamen, "It is still our duty to fight for our country, into whatsoever hands the government may fall." Even during the great mutiny of the Nore, when the whole British fleet had been forced by oppression into a hostile attitude towards the government, the seamen, while insisting upon their rights, declared their readiness to go out whenever called upon to fight the French.

In our own time and country it is believed that there can be

found no authoritative declaration opposed to the maintenance of a navy proportioned to our ocean commerce. Washington, when President, urged upon Congress the policy of maintaining an efficient navy as a means of vindicating the nationality of the flag and insuring the preservation of peace. The safety of a navy lies in the loyalty of the seaman to his flag. Fenimore Cooper furnishes some strong testimony on this point. Speaking of the affairs of the colonies, he observes: "It has been said that the gentry of the country had begun to place their sons in the British marine previously to the commencement of the war of the Revolution; but while many instances occurred in which Americans threw up their commissions in the British army in preference to serving against their native land, very few of those who had taken service in the navy followed their example. The second nature which the seaman acquires in time appears to have drawn the cord too tight to suffer it to be snapped even by the violent struggle of a civil war; and most of the young men who were born in the colonies, and who found themselves arrayed against their proper country on board the ships of the king, continued to serve with the undiminished zeal and singleness of purpose that is apt to distinguish the fidelity of a seaman to his flag."

While our people were still fresh in the enjoyment of their liberties, we find, in the report of the House Naval Committee, under date of November 27, 1812, the following beautiful tribute to the loyalty of our seamen: "It is with something like exultation," say the committee, "that we present a species of national force (the navy) that, whilst it will best subserve the national defense, can operate least on national liberty. It is a bright attribute in the history of the sailor that he has never destroyed the rights of the nation. In its defense only is he to be found."

In a speech delivered January 31, 1816, on a motion to repeal the direct tax, Calhoun gave his views concerning the lessons to be derived from the experiences of the War of 1812, as to the policy which the United States ought to pursue in future. The starting point of his argument was the assertion that future wars are not only possible but probable. He, therefore, deemed it necessary gradually to prepare for such an emergency not only by increasing the military forces of the Union, but also by systematically developing those germs of giant strength which Providence had bestowed upon the American people. "As to the

species of preparation," he said, " . . . the navy most certainly, in any point of view, occupies the first place. It is the most safe, most effectual, and cheapest mode of defense." And his biographer very wisely adds: " The internal strife during the Civil War would have lost much of its bitterness if the majority had from the first understood this obvious truth and acted accordingly." John C. Calhoun was not only " a man of deep convictions," and in political affairs gifted with the eye of prophecy, but as Secretary of War, under Monroe, he exhibited evidences of true military genius. He found the War Department in a state of unutterable confusion. " Into this chaos he soon brought order, and the whole service of the Department received an organization so simple and, at the same time, so efficient that it has, in the main, been adhered to by all his successors, and proved itself capable of standing even the test of the Civil War. (" Life of J. C. Calhoun," by Dr. H. von Holst.) And it was Calhoun who first projected that vast scheme of internal improvement consisting of military roads and waterways that have been carried on ever since. These facts add great weight to his opinion that the navy is at once the cheapest, safest, and most efficient arm of public defense.

In the exhaustive discussion which took place in 1836 on the subject of our national defenses, General Cass, then Secretary of War, laid great stress on the necessity of a naval force, which, according to his views, should have been much larger than it then was. This opinion was indorsed by the high authority of General Jackson. " It seems to me," General Cass remarks in his letter to the President, under date of April 7, 1836, " that our first and best fortification is the navy. Nor do I see any limit to our naval preparations, except that imposed by a due regard to the public revenues from time to time, and by the probable condition of other maritime nations." " No well-directed effort," said the late Mr. Secretary Welles, " should be spared to increase our naval strength; for it is mainly on the ocean that our rightful position as a nation is to be secured and maintained. The sailor is always and everywhere true to his flag."

We think we have fully established the soundness of our proposition. It only remains now to examine the latter part of the clause quoted from Mr. Marcy's letter: " The expense of keeping them up is burdensome to the people." The cost of our navy

does not necessarily fall upon the taxpayers. So long ago as 1812 it was proposed to set apart for the support of the navy one-third of the revenues derived from commerce. Considering the close relations and mutual dependence existing between the national and the commercial marine, there is a degree of propriety in the suggestion which cannot fail to commend it to the legislator. An efficient navy, by preventing war, saves commerce, and protection to commerce means protection to agriculture. A navy polices the seas, keeping down piracy and the impressment of seamen. It pushes the work of discovery, hydrography, and astronomy to distant seas, and reduces the dangers of navigation. It gives countenance and confidence to our merchants doing business in foreign ports, and furnishes a moral support, rarely appreciated at home, to our ministers, consuls, and other representatives abroad.

By the last official returns, the receipts from customs for the fiscal year ending June 30, 1906, were, in round numbers, $300,000,000. Deducting $9,000,000 for expenses of collecting, would leave $291,000,000, one-third of which ($97,000,000) would be ample for the support of a "powerful navy," if expended with a due regard to economy, and not prove "burdensome to the people."

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

TWO PICTURES OF NELSON'S TIME.

By GILBERT TOTTEN MCMASTER, M. D.

The portrait of Nelson is from a steel frontispiece in "The Life of Nelson by Robert Southey," Vol. I, 16mo, published in New York by Eastburn, Kirk & Co., at The Literary Room, corner of Wall and Nassau Streets, and R. P. & C. Williams, Boston, 1814.

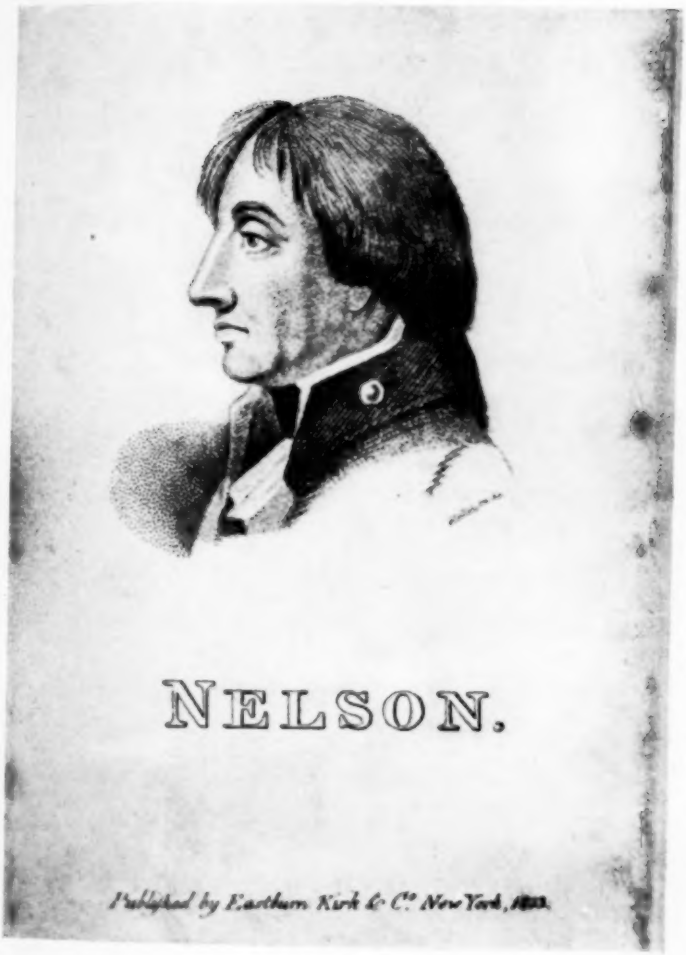
I believe the edition to be quite rare. The book originally belonging to my great-grandfather, Captain Gilbert Totten, of New Haven, Conn.

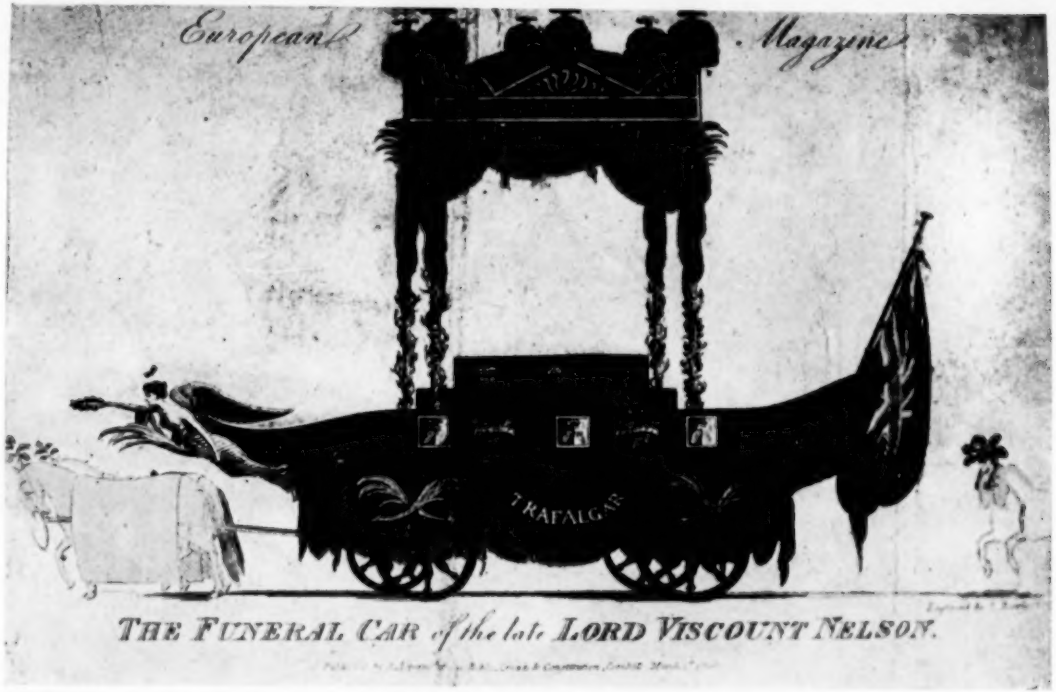
The funeral car of the late Viscount Nelson is from a frontispiece in the European Magazine for March 1, 1806, published by J. Asperne at the Bible, Crown, and Constitution, Cornhill, March, 1806. I came across this plate by accident. The owner of the valued pamphlet was the regular pie-eating, short-sighted Connecticut Yankee of the farm. Nothing would induce him to part with the magazine. To him its value was unknown. He was "willen tew sell the pictur fer 10c." This was invested. Being a Yankee of the same State I feel justified, as he told a friend he made the young doctor pay 10c. "fer what he was going to throw away."

The proportions of the car are lacking. Taking the length of the casket, let us say six feet, rather large; but to gain proportion this may give some idea of length and height, over all, keeping in mind this one item, that the horses seen drawing the affair are a little under size to be in proportion. Now, we might have height from base of tire of rear wheel to top 18 to 19 feet and length from wreath held in figure's outstretched hand to extreme stem in a line drawn under casket, 22 to 29 feet. Space between pillars might have been 8 feet. Height from ground to top of

casket, 9 to 9½ feet. These measurements are purely conjectural; nothing to back up the measurements given except proportion.

As an artistic production, it is in keeping with the period. Looking at it in its true light, namely, as a tribute to a noble soul, it exhibits the adoration of the English for "The First Gentleman of the Line."


NELSON.
Published by Eastburn Kirk & Co. New York, 1833.



THE FUNERAL CAR of the late LORD VISCOUNT NELSON.

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THE SHIP'S STORE AND ITS POSSIBILITIES.

By PAYMASTER GEORGE P. DYER, U. S. Navy.

In discussing the general mess [1] we had to do with an organization regularly created and fitted to ship life through law and regulation. It needs only the development of detail to make it fulfill its function. With the ship's store or canteen, as it is popularly known, the situation is different. The question of its proper establishment must be taken up before those of administration. Though a flourishing institution on most vessels in the navy it has no official standing as a necessary and required part of the ship's organization. It exists by suffrance only, because it is so convenient. Just how convenient may be better appreciated, perhaps, by giving a few figures from actual experience. On the *Missouri*, the sales from February 1, 1904, to August 18, 1906, thirty and a half months, have aggregated $41,614.12. The last twelve months, in port and out, sales averaged $1676.82 per month. The three months of the last winter's cruise away from home they averaged $2300.07 per month. A better idea of what this means in the way of business may be gained from the fact that since it opened there have been sold over its counters the following items among others: 116,853 packages of tobacco, 58,390 cakes of soap, 49,968 packages of candy, 43,509 packages of crackers and cakes, 5796 packages of dentifrice, 3815 towels.

A statement of the reason the regulations governing such a substantial business are permissory or advisory only, discovers the root of all difficulties of the present canteen. The funds creating and supporting it are furnished from private means. As a consequence, its establishment is optional. Some ships do not have canteens. Those which do, manage them as they please, independently of all other canteens on other ships and all other stores

[1] "The Modern General Mess," Naval Institute, June, 1906.

on board the same ship; subject only to the most general provisions as to their conduct and for the audit of their accounts.

This ought not to be. If the canteen has won its place it should be recognized and established on a regular basis, especially when it takes but little experience to see a far wider field for it, under such conditions, than it now occupies. Canteens would be useful ashore at our various stations as well as afloat, and for the families of officers as well as for those of enlisted men. It would mean much to all such to have access to a store selling articles at manufacturer's cost; and much to the canteens at sea to have depots ashore to supply stock in which no middleman's profit would figure. In other words, if a way could be found to organize the present independent units into a system like that of the commissary stores in the army (with some of the features of the post exchange added), all the usual advantages flowing from co-operation would result. The need for such stores exists, as is proved by the ever-increasing demand upon ships' canteens now operating; the machinery for assembling and distributing their supplies is at hand: all that is required is the organization itself, the decision as to whether it can be effected within existing statutes, and, if not, the determination to secure the necessary authority.

The effect of being able to deal at all times—as one is now occasionally when aboard a ship which has a long-established canteen—with a store from which goods are sold at prices made possible by lumping purchases sufficiently to get wholesale discounts, is plain enough. Officers and men would be able to protect themselves, in a degree, from the ever-advancing prices of all ordinary commodities by increasing the purchasing power of their money. Or, to put it another way, they would sensibly increase their pay. How much this increase may be will be seen farther on.

Until some means are suggested by which such a millennial state of affairs can be brought about we shall have to take those provided and make the best of them. With this view let us take up the features of the present ship's store with its bad and good points. Through a statement of them, and the advance of views, perhaps discussion can be raised which will clarify the situation and bring more or less conformity to practices now as varied as the number of ships having canteens.

The regulations provide: "He (the commanding officer) may

in his discretion establish a ship's store for the sale of articles not forbidden by law or regulations when the crew desires such action and is willing to contribute the funds necessary to make the first purchase of stores."

For the sake of brevity, the disadvantages of a position so indefinite may be put in more or less tabulated form.

It is not a compulsory institution. In fact, its establishment is made difficult. If the enlisted men are not long-sighted enough to advance the funds necessary, the opening of a canteen may easily be delayed for an indefinite time. The requiring of contributions from the crew is but a poor makeshift as any one can testify who is acquainted with the conditions on board a new ship, where the men do not know or trust their surroundings, and where for the most part they have no money to spare from immediate needs. Cases are rare where sufficient funds are raised by a crew to get any but a meager stock for the first day's sale. Yet there is no doubt of the value of a canteen to all hands; to all through the saving afforded; to the careless in foreseeing their needs in time before leaving port; and to the ship from a disciplinary point of view.

The contribution plan brings all sorts of disadvantages in its train. The contributors have to be repaid and the money to repay them, as well as to furnish the capital to run the business, has to be obtained by boosting prices to full retail figures for, usually, a year or more. With fixed charges, like rent, salaries, etc., reduced to nil it should never be necessary to charge retail prices. A ship of the first class ought to have a capital of at least four thousand dollars to work to best advantage. It may thus be seen what a money-making device the canteen is forced to be until it can repay its loans and get to this favorable position.

When necessity for the use of this accumulation no longer exists, as when a ship goes out of commission, what is to be done with it? The regulations provide that in such a case the assets shall be divided equally amongst the members of the general mess. The general mess does not include all the patrons of the canteen; officers, chief petty officers, and others help to build it up. Again, if the usual changes in the ship's complement have taken place there remains but a small portion of the men who originally helped to create the fund. Founded by one set of people who reap nothing from it save convenience, at least through the "re-

tail price" period of its upbuilding, its profits are divided by another set. To show the truth of this the experience of the *Missouri*, believed to be typical in this respect, may be cited. After being in commission thirty-three months but 242 of her original complement of 730 odd enlisted men yet remain. More equitable by far would it be to all concerned to run the store on borrowed capital if it could be done, even if handsome interest had to be paid on it.

There is no uniformity amongst ships' stores either in (1) policy; (2) prices; or (3) quality of stock. To take up differences in policy first. Some variations are due to the necessities in individual cases as just shown, or on account of insufficient space to stow a proper stock, or of poor markets in which to buy. But aside from these considerations, policy differs as widely as the ideas of the managing officers. The phrase "different ships different long splices" was never more aptly illustrated. Ships may have canteens or they may not. One store keeps only articles it is thought the crew ought to buy for its own good; another tries to keep everything there is a collective call for, and offers mail-order facilities for unusual items besides. As to this last, there ought not to be any difference of opinion; but there is. If the store is instituted for the convenience of the ship's company it ought to be made to fulfill that function to the maximum degree. Of course, no obligation exists to create business by raising an artificial demand with catch penny articles, or through display advertising, such as rests on a private business, where more sales mean more dollars profit. But every article which is twice inquired for should be kept tentatively in stock and well displayed until the question of its desirability as a permanent addition is settled. Moreover, new and useful articles which are constantly being brought to attention by active advertisers should be tried whenever they seem likely to create a legitimate demand. The canteen officer, in brief, should not judge for his customers and try to help them save their money, but do his best to help them spend it on what they really want, and to give them the best value for it. The list at the end of this article embodies a good deal of experience in adding and cutting stock items, and though sales vary much on different ships, and at different times on the same ship, it may be taken as a good example of the result of nearly three years' effort along these

lines. The quantities indicated for each item constitute an actual experience of approximately what a ship's company of eight hundred men will use in three months away from home ports. Few ships can afford space for so much; but the list as it stands will serve for comparison. At home sales are less, of course. The prices shown are those actually charged in August, 1906, and in no case represent a loss on cost. The notes following the list combine miscellaneous experience which finds no place elsewhere in our discussion.

Policies differ as to the amount and disposition of profits even amongst canteens which are well established. There is undoubtedly a tendency to keep prices up near the retail mark after it is necessary, in order to meet all the numerous calls on the canteen for athletic and entertainment expenses sure to arise when it becomes known that money is available.

The doctrine officially advocated is, I believe, the correct one, that "the monthly surplus should be reduced to a minimum, thus disposing of the regular retail dealer's profit in the most equitable manner possible, *i. e.*, by giving the benefit of it to each purchaser in the form of a discount." Without the necessity of either paying rent, salary, license, delivery, or other fixed charges the canteen ought to give each purchaser such a discount over the usual retail price of from fifteen to forty per cent.

It is very convenient to have a small fund for amusement expenses. It saves much of the subscription business which is so troublesome aboard ship and which always rests most heavily on the more public-spirited of the crew. Some money will accrue through differences of cent fractions; there is no objection to increasing it further by imposing a small charge over cost of articles of luxury, like cigars and candy, to supply such needs; but it should be distinctly borne in mind that this is the exception, and that *cost, not profit, governs the selling price.*

Some ships allow bumboatmen to do business on board as well as the canteen. Though traffic with bumboats may be undesirable from the standpoint of discipline, the ship's store's policy should be when permitted, to enter into rivalry with them. Competition with the bumboat is good for more than one reason. It gives a line on prices, often suggests good ideas for stock,—for the bumboatman is expert at reading the crew's desires. Best of all it furnishes daily proof to the men of the benefits of the ship's store,

and prevents any feeling against it apt to arise if they are restricted to purchases from it alone. Only one rule need be made with regard to the bumboat. The canteen yeoman should inspect its wares, after the executive has made the necessary disciplinary stipulations, to make any recommendations necessary to prevent the sale of articles competing with the canteen stock but of inferior quality.

Bumboats are often very convenient to use to handle perishable articles like milk, pies, and fresh fruit which, as stock, are more or less speculative in character. Frequently rivals will bid for the privilege of bumboating the ship. What accrues from this source turned into the canteen amounts to an indirect reduction in prices, since the crew as a whole gets the benefit of the gain.

Ideas differ as to the methods of keeping the accounts of the ship's store. A simple system is indicated in the General Mess Manual. It is too simple in fact since it makes no provision for keeping track of orders or liabilities. Personally, I prefer the system sanctioned by use in civil life in similar businesses which includes a set of double entry books: daily blotter, journal, and ledger, an order book, and a stock book. No shop business could be less complex. All patrons pay cash and liabilities are strictly limited to merchandise. Besides the ledger accounts with dealers none are needed except "merchandise," "cash," and "profit and loss." The order book keeps track of current deliveries and the stock book merely of receipts, and expenditures of articles as shown by a double checked inventory taken monthly. This "double check" extends all through the canteen's affairs. Two men (the commissary officer or some one from another side of the pay department work, and the canteen yeoman himself), check all transactions affecting stock: deliveries, inventories, etc. The extra man initials his count and understands he is responsible for its correctness in case of question. The canteen man makes sure of it for his own protection.

Orders are usually placed after bids have been invited. Samples should always be required with each bid to be kept until after the delivery. *Award should be made on quality, and then on price.*

I find it most convenient to enter all stock at the selling price as soon as received. That is, the profit is taken when the goods arrive and not when sold. This is simply for convenience as it

reduces all stock computations to one set of prices. It is justified by the fact that the canteen, unlike shore stores, charges very little profit. Stock on hand at selling prices differs very little from its cost, so that no undue inflation of assets is produced in this way. In any event, in case of wind-up whether held at cost or selling price would make no difference. The stock would then be worth just what it would bring, and no more.

As methods vary, prices vary. Beside the differences necessarily flowing from variations in policy there is a wide difference in the ability to buy. Some men are better purchasers than others though all be equally conscientious. Many tricks in the retail trade need to be learned with experience as the only teacher. It is to the interest of small dealers to have the cost of their goods concealed as much as possible. If in selling they can make a statement, or show evidence as to cost which is within the letter of the truth, but which takes no account of rebates, discounts, and "deals" allowed them, they are glad to take advantage of it. The wholesaler, therefore, employs many ingenious dodges to accomplish this, especially as it helps to conceal his prices from his competitors. It is common for published price lists to be subject to three discounts through which the purchaser has to fight his way. Deals, "open" and "covered" furnish very interesting manifestations of the elaborate structure reared to trap the unwary into paying the top price. An "open" deal is one wherein the lump purchaser gets a certain amount of stock thrown in gratis, with his purchase. For instance, recently the manufacturers of a well-known washing compound gave away an extra case of their goods with every five ordered. The five cases would be billed at the standard price and the sixth one come along on a separate "no charge" bill. Thus the retailer could say his packages cost him so much each; and still sell his sixth case, which cost nothing. A "covered" deal is a still more subtle form of the same sort of transaction. An example is furnished by manufacturers of a popular brand of cigars, who had a certain standard price, say $35 per thousand, which they made the dealer actually pay within thirty days; then every six months they would cast up his account and return him a draw-back check for, say $2.50, for each thousand cigars he had bought during that time. Thus the dealer is permitted to announce he pays three and a half cents each for his cigars when he actually winds up by paying a

quarter cent less. It is no wonder then, that one can never be sure of getting the "last price" on a purchase for the canteen though he exhausts his imagination in the effort to see through the middleman's profit.

A difference in markets, also, necessarily affects the price of articles, although not so much as one would imagine in the case of standard items in home ports where broadcast advertising has resulted in a demand which allows the manufacturers to put the price up so near the retail limit that they have to bear freight charges to local depots to leave the small dealer any profit at all.

In the case of ships abroad it is often necessary to pay any price asked to get the home brands of goods the men are accustomed to,—if obtainable at all. This frequently puts the canteen patron serving at the will of the government on foreign station at a disadvantage with his fellow blue jacket more fortunately stationed in home waters. It is a handicap he ought not be made to bear, for if the privilege of buying such items is given at all it is only equitable that prices, of standard articles at least, should be the same wherever men are stationed. No canteen, however, would be justified in the risk of ordering goods sent by freight to foreign station with the movements of our vessels as uncertain as they are; and the surer means of government transportation is not at present generally available for canteen stores.

A minor reason for difference in prices which can be easily remedied is the fact that most ship's stores do business on a five- and ten-cent basis. There seems to be a prevalent objection to making change in pennies, though there is no real reason why it should not be as easy as making it to nickels. It takes but a very short time for a canteen yeoman to become accurate at it, as has been proven by going months at a time with a difference, chargeable to errors, of not more than a dollar either way on an average monthly business of nearly two thousand dollars. At any rate it is not possible to have the selling price approach cost unless one does use odd cents for the reason that wholesale packages and prices are usually graded to allow the retailer to make his profit in selling at even nickels.

Some canteens keep to nickel selling and keep down their profits by adjusting prices so that gains and losses will balance when the items are sold out. It is manifest that if one sells one

article for ten cents, at two cents loss, and another at the same price with two cents gain, no profit results. But this practice violates the canteen principle that each purchaser should receive the maximum benefit from his purchase, and it is therefore not to be recommended.

Quality differs also. The main reason for this difference in ship's stores is because buying is practically confined to purchases from middlemen. Manufacturers will always "protect the jobbers" as against small dealers, be they ever so shrewd. Neither do they care usually to undertake the trouble and cost of making small deliveries. The result is that the middleman while making his legitimate profit through discounts and rebates is constantly exposed to the temptation of increasing it by offering inferior goods. The only remedy is to buy standard brands in spite of all persuasion, unless there be ample opportunity for test. In every line there are some makers who have established a reputation they are proud to maintain. If their brands are required the contest narrows down to the question of price. A fundamental rule of the canteen finds place here. *None but the best plain quality in food stuffs and toilet articles, and no poor quality of any article should be carried.*

All these differences in policy, in price, and in quality manifestly tend to reduce the efficiency of the ship's store service. With stores permitted to be conducted independently of each other, in stock supply, and in all other methods, the results of carelessness or incompetency can go unchecked and uncorrected. Yet dissatisfaction in a ship whose crew sees the store on another in better condition is not always justified. Poor results cannot invariably be laid to such causes. As we have seen, a new vessel begins at a heavy disadvantage to which is often added an entire lack of experience with trade conditions on the station. The critical comparisons made are not always fair when one thinks the whole burden of upbuilding and conduct, often without adequate means, is laid on those who manage the canteen.

It must be admitted, however, that the present system does have one great advantage. Through the very fact that it is not fully subject to regulation an escape from the methods imposed by our out-of-date naval purchase laws is allowed. The business of the canteen can now be done in the way an ordinary business man would conduct it. The commissary officer goes where

he pleases for stock and pays what prices may be necessary to secure good quality. To limit this power too much would work a serious injury especially in the case of "trust" articles, which make up a large part of the stock,—whose cheap imitations would be apt to make trouble in any attempt to purchase under general specifications after advertisement. Consideration of the subject of surmounting this and kindred difficulties in case canteens should be maintained with public funds has led to the following suggestions:

In the case of lump purchases originally made at central depots, how might the receipt of undesirable material under advertisement for competitive bids be avoided? To frame specifications for many canteen articles would be impossible without reference to standard brands, which is not permitted. Besides, whatever their quality, there are some things the men want by name, having been accustomed to them, or "educated" by advertising. The store should cater to such demands, but it would be difficult under present practice to fulfill them from original purchases, for every merchant has the right to compete for the business of the government without prejudice. But if the seldom-emphasized rule in competitive purchases be borne in mind, that of the two elements *competition in quality is more important even than competition in price*, why would it not be feasible to advertise for such stores as necessary with award to be made on the basis of quality primarily? This is now done in the case of certain other stores bought for sale to the service, where there can be no question of loss to the government. In the case of canteen stores, it should be possible to go so far as to advertise for goods *to cost a specified unit price delivered*. It is believed this is practicable at least for articles whose output is so controlled that the manufacturers' prices are held at unvarying figures. It is recognized that with such a method of purchase certain dangers need be avoided, and that even more rigid care in inspection of samples would be necessary than where the award is largely determined by the price; but on the other hand, it would cut the gordian knot binding our hands to the lowest bidder. Makers of inferior goods would not then think it worth while to compete under such circumstances, and a large number of our most troublesome dealers would disappear.

In such special cases in which it is advisable for the canteen

to buy for itself in order to get just what it wants or for any other reason, if a small allotment of cash outright for such uses is not practicable, cash will soon accumulate from sales. Repayment for supplies put on board as with other stores need not be made at once so long as periodical returns from the ship show such repayment as secure. Suppose a ship is furnished with four thousand dollars worth of canteen stores. It is within the province of the administrative officers to permit the use of the proceeds of sales of such stores, under proper restraint, for the further purchase of supplies in unusual cases, and by the less rigorous, but equally safe, methods used in other ship purchases. In case of doubt as to this power it could be assured by the issue of a Presidential order as suggested in the January issue of the NAVAL INSTITUTE placing purchases made with canteen funds under Sec. 1549 R. S., which gives him authority, "to make such regulations for the purchase .... of all articles, stores, and supplies for persons in the navy as may be necessary for the safe and economical administration of that branch of the public service."

However regulated the conclusion is inevitable, that some latitude would have to be left the canteens in using funds resulting from sales. Often it would be impossible to get supplies in time, if at all, from the nearest depot. Local markets, especially abroad, sometimes can furnish articles more cheaply than they can be bought at home. Souvenirs cannot be bought usually away from a particular port. Perishable stores, too, are sometimes advisable for stock. Therefore, in any plan, provision will have to be made giving power to the commissary officer to use at least a certain percentage of monthly sales for local needs. The option should also be given the ship to charge a very small profit on certain specified articles of luxury, to provide for unavoidable losses, amusements, and other minor expenses properly chargeable to the store.

This somewhat extended discussion of the requirements and the impediments of a government-supported canteen is advanced with the idea that a general commissary system for the navy is much needed. Many men in the service do not have the privilege of access to a canteen, though with as much right to it as those who have. Numerous officers, too, as well as families of men and officers, do not have opportunity to purchase at cost the many common articles it contains. Once established the vista opens of an

added function at shore stations, like the present army commissary, as purveyor of all sorts of household as well as personal articles. What this means to us all I have attempted to show approximately by comparing canteen with ordinary retail prices in the list below. A unit of each item of stock would result in a purchase from the ship's store amounting to **$26.28.** The same articles would cost in the usual city retail stores **$33.38.** There is, therefore, a difference of **$7.10,** or a saving in per cent in favor of the canteen of more than **21** per cent. It must be remembered that this does not represent the total possible difference; for, bought in bulk, many of the canteen prices would be slightly lowered.

It has been calculated recently that the living expenses of the average family man, in moderate circumstances, as separate from his rent and expenditures for clothing and luxuries, may be estimated at least at **30** per cent of his income. If this be true of navy men, with the above figures a maximum of **21** per cent could be saved on such living expenses, which would be tantamount to an increase in income of **6.3** per cent. However correct these computations may be it is certain we could be much in pocket if we could always deal at such a store for the commodities whose mounting cost is so perceptible.

A need defined is half supplied. Given concerted determination to find them and means will not long be lacking to organize a ship's store system for the navy. When found the whole service will say, Hail! to him who shall give it form.

TYPICAL LIST OF SHIP'S STORE STOCK.

Stock. (3 mos. away from home—800 men—Est. value $8,500.)	Articles.	Ship's Store Selling Price.	Usual Retail selling Price.
18 doz.	Soap boxes	.18	.25
18 "	Bathing sponges (rubber)	.40	.60
6 "	Hair brushes	.25	.35
6 "	Shaving brushes	.25	.30
18 "	Prophylactic tooth brushes	.20	.35
36 "	Tooth brushes	.18	.25
18 "	Coir brushes (Gibraltar)	.15	.35
12 "	Tape and nail brushes	.10	.10
18 "	Rubber Combs	.08	.15
6 "	Leather belts	.25	.25
36 "	Cascarets	.08	.10
4 "	Court plaster	.04	.05
6 "	Cold cream	.10	.10
192 "	Baked beans (Heinz's)	.04	.05
30 "	Catsup (Heinz's)	.09	.10

Stock. (3 mos. away from home—800 men—Est. value $8,500.)	Articles.	Ship's Store Selling Price.	Usual Retail Selling Price.
25 cases	Peaches (canned)	.15	.20
50 "	Pears (canned)	.15	.20
75 "	Tomatoes (canned)	.10	.12
75 "	Condensed milk ("Defiance")	.08	.10
8 doz.	Horse radish	.10	.10
100 "	Ham and tongue (potted)	.04	.05
140 "	Jams, assorted (Curtice Bros.)	.10	.10
30 "	Prepared mustard	.05	.05
8 "	Olives (Heinz's "Manzanilla")	.13	.15
24 "	Sweet pickles (Heinz's)	.09	.10
3 gro.	Fruit preserves (Heinz's, in glass)	.10	.10
2,500 tins	Sardines (Norway)	.10	.13
48 doz.	Veal loaf	.08	.10
24 "	Celery sauce	.10	.10
144 "	Soda biscuits (National or Austin and Young)	.05	.05
300 "	Assorted cakes	.10	.10
100 "	Fig bars	.13	.15
96 "	Zuzus	.05	.05
4 "	Blanco (in boxes)	.18	.25
2 "	Blanco (cakes)	.04	.10
120 "	Cream cakes	.03	.05
5 "	Collar buttons (bone)	.01	.01
6 "	Collar buttons (plated)	.05	.10
7 "	Memo. books	.20	.25
12 "	Bromo Seltzer	.08	.10
5 "	Whisk brooms	.15	.25
5 "	Brass buttons (officers')	.16	.20
100 "	Button rings	.05 dz.	.05 dz.
2,400 pkgs.	Peanut brittle	.08	.10
12 doz.	Chocolates (1 lb.)	.54	.80
120 "	Chocolates (½ lb.)	.27	.40
264 "	Assorted candies	.08	.10
120 "	Candy (5¢ pkgs.)	.04	.05
1,000 pkgs.	Sweet Caporal cigarettes	.04	.05
1,500 "	Turkish Trophies cigarettes	.08	.10
1,000 "	Hassan cigarettes	.04	.05
1,000 "	Murad cigarettes	.10	.15
1,500 bks.	Cigarette papers (rice) ("Riz La+")	.025	.05
200 "	Cigarette papers (wheat straw) ("Riz La+")	.025	.05
36 doz.	Playing cards ("Tally Ho")	.15	.25
10,000	Cigars (popular 5¢ brands)	.04	.05
3,000	Cigars (popular 10¢ brands)	.07	.10
5,360 pkgs.	Duke's Mixture	.05	.05

Stock. (3 mos. away from home—800 men—Est. value $8,500.)	Articles.	Ship's Store Selling Price.	Usual Retail Selling Price.
9,600 pkgs.	Bull Durham	.05	.05
3,360 "	Cut plug (smoking)	.05	.05
700 tins	Curve cut (smoking)	.08	.10
1,000 plugs	Star, chewing	.08	.10
672 "	B. L., chewing	.09	.10
30 doz.	Briar pipes	.35	.50
24 "	Corn cob pipes	.03	.05
8 gro.	Woodstock pipes	.02	.02
3 "	Horn bits	.03	.05
6 doz.	Can openers	.10	.10
3 "	Checker boards and checkers	.20	.25
30 "	Garters (Boston)	.17	.25
36 "	Linen handkerchiefs	.08	.13
30 "	Bandana handkerchiefs	.10	.15
2,500 pkgs.	Chewing gum (Beeman's)	.03	.05
30 doz.	Ink	.03	.05
5 "	Ink, fountain pen	.25	.25
3 "	Ink, Indelible	.20	.25
6 "	Jackknives, assorted	.40	.50
12 "	Locker padlocks	.20	.25
4 gro. pkgs.	Clothes stops ("Reg.")	.20	.25
5 doz.	Listerine, small	.16	.25
3 "	Listerine, large	.60	.75
18 "	Mirrors	.20	.25
1,800 pkgs.	Matches, safety ("Orient")	.05	.05
4 doz.	Mucilage	.05	.05
100 "	Metal polish ("Solarine")	.13	.15
36 papers	Safety pins	.05	.05
100 "	Needles	.05	.05
9 doz.	Penholders (Faber's)	.05	.05
5 "	Fountain pens	2.00	2.50
10 gro.	Pen points	.01	.01
18 doz.	Lead pencils	.04	.05
300 pkgs.	Envelopes	.05	.10
5 gro.	Writing paper (with ship's crest)	.25	.25
1 "	Writing paper (with ship's crest)	.40	.50
48 doz.	Writing tablets	.10	.10
60 "	Tooth powder (Dr. Lyons')	.15	.25
24 "	Tooth paste (Euthymol)	.15	.20
10 "	Talcum powder (Mennen's)	.15	.25
9 "	Rubifoam	.15	.25
24 "	Cuticura soap	.18	.25
30 "	Woodbury's facial soap	.15	.20
24 "	Pears, unscented	.10	.15
120 "	Assorted toilet soap	.08	.10
2,000 bars	Ivory soap	.04	.05
7,000 "	Naptha soap (P. and G.'s)	.04	.05

Usual Retail Selling Price.	Stock. (8 mos. away from home—800 men—Est. value $8,500.)	Articles.	Ship's Store Selling Price.	Usual Retail Selling Price.
.05	12 doz.	Arnica tooth soap	.15	.25
.05	12 "	Tar soap (Packer's)	.15	.20
.10	500	Tar soap	.05	.05
.10	500	Lava soap	.05	.05
.10	9 doz.	William's shaving stick	.18	.25
.50	9 "	William's shaving cake	.05	.05
.05	6 "	Hand Sapolio	.08	.10
.02	6 "	Ponds Extract	.40	.50
.05	6 "	Vaseline	.04	.05
.10	30 "	Witch-hazel	.10	.15
.25	24 "	Ammonia	.10	.10
.25	2 "	Sleeve holders	.05	.05
.13	2 "	Scissors	.20	.25
.15	60 doz. prs.	Shoe strings	.03	.05
.05	24	Safety razors	3.75	5.00
.05	1 doz. sets	Safety razor blades	.45	.50
.25	3 gro.	Shinola	.08	.10
.25	6 doz.	Shoe polish	.05	.05
.50	3 gro.	Electro silicon	.08	.10
.25	3 doz.	Razor strops	.35	.50
.25	1 "	Suspenders	.40	.50
.25	5 "	Suspenders	.25	.25
.75	720	Turkish towels	.15	.20
.25	12 doz. pkgs.	Tooth picks	.05	.05
.05	36 "	Linen thread and cotton	.05	.05
.05	6 "	Sewing silk	.08	.10
.15	3 "	Thimbles	.05	.05
.05	6 "	White lisle gloves	.15	.20
.05	4 "	Composition collars	.20	.25
.05	24 "	Shinola outfits	.20	.20
2.50	3 yds.	Crepe (black)	1.20	1.20
.01	400	Novels	.10	.25
.05	6 doz.	Liquid shoe polish, black	.08	.10
.10	5 "	Liquid shoe polish, russet (Whittemore's)	.18	.25
.25	1,200 books	Stamps (25¢)	.25	.25
.50	100 "	Stamps (49¢)	.49	.49
.10	25 "	Stamps (97¢)	.97	.97
.25	200	Stamps (5¢)	.05	.05
.20	100	Stamps Special delivery	.10	.10
.25	300	Stamps (8¢)	.08	.08
.25	3,000	Stamps (1¢)	.01	.01
.25	100	Postal cards	.01	.01
.20		Regulation clothing and small stores as needed		
.15		Periodicals		
.10			$26.28	$33.38
.05				
.05				

NOTES.

Never let stock run out and disappoint people who have a right from published lists to expect to get what they ask for. At home a little foresight and watching of stock can accomplish this. Nothing is a surer index of the character of the store's administration or creates more comment favorable, or otherwise, than the way stock is kept up. If unavoidably caught any reasonable expense in telegraphing and delivery by express is justified.

In foreign ports inquiry should be made to discover any native products obtainable more cheaply than at home. Coir brushes in the Mediterranean and cigars in the Caribbean illustrate this.

It is to be remembered that ship's mail when in foreign ports is forwarded with United States postage, and that before sailing away from home an ample supply of American stamps should be laid in.

After the canteen is well established special lines of stock for which there is no regular demand may be taken up for two weeks at a time. Preference should be given to articles which usually have to bear a large percentage of fixed charges like those sold in shops necessarily elaborately fitted and in locations where rent is high. For instance, watches with chains, fobs, clasp pins, etc., have to be sold at a great advance over jobbers' cost to cover expenses. They can be sold from ship's store for cost if provision is made for return in case of no sale and a deposit of the price is required at the time of order.

A modified form of circulating library can easily be maintained. Cloth-bound books regularly purchased if returned in good condition can be exchanged for others on payment of a small additional amount for the exchange. A standing order should be placed with a news agency for the supply of current periodicals. Men buy them eagerly.

"No credit sales" should be an inflexible rule from the day the canteen opens. By adhering to it, many errors and small losses will be avoided. All losses and breakage should be verified at the time of occurring on being reported by the canteen yeoman to the pay office.

Always have a canteen list posted in full view in order that purchasers may check prices charged. A canteen bulletin board on the main deck for notices is very convenient. It is better to order stock frequently where possible than to run any chance of its deterioration. This applies to candies, cakes, articles with rubber in them, like garters, and those liable to rust.

It is well to make up the monthly statement of the canteen a few days before pay day when sales are at their minimum, instead of at the end of the calendar month. The congestion of work in the pay department at the end of the month is somewhat relieved by doing this.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE STUDY OF BATTLE TACTICS OF THE SQUADRON.

By COMMANDER W. R. RUSH, U. S. Navy.

I.

On the deck of a battleship the other day, an officer was overheard to criticise unfavorably the mechanism of the breech closing apparatus of a small gun. One turned to me and said, "Strange, isn't it, how many there are who have 'always the torch to destroy—never the hammer to build.'" We afterwards examined attentively the mechanism and its working, and found reasons for the odd construction; and that, as far as we could judge, it was efficient, and an improvement on previous types of which we knew. So, we, in turn pronounced the critic one of those ever ready to attack, to pull down the careful work of others, most often without investigation of it, often without valid reason or argument, and always without having anything to offer in its place.

This incident was forcibly brought to mind upon seeing in print, what appears now as a rather blunt and brutal criticism of a certain earnest studied work. I refer to my few remarks in the discussion of Lieutenant-Commander Niblack's essay on battle tactics, in the last number of the PROCEEDINGS OF THE U. S. NAVAL INSTITUTE.

Upon the occasion of careful reading of that essay, I must own to the natural impatience of one who, with hearty appetite, is in anticipation of "falling to" upon a fine looking joint, but who finds it, when carved, underdone, at least, to his own liking. Perhaps, however, as the joint, in this case, was served for all, silence would have been the better part of politeness; but the idea being to get the joint right, and all having a true and intense interest in its being just right, I take it, that all should be heard upon what they believe to be the right method of prepar-

ation, without being understood as criticising the accomplished chef. With this apology, and acting on this principle, I submit the following.

To come at once to the point, the question before us is how to form, and maneuver the battleships of a squadron upon approaching the enemy; how to form the line of battle; and how, and when to engage him; having throughout but one sole object in view, namely *to win success* in the most artistic, yet economical manner.

So very much has been written upon this subject, in a general way, by critics both professional and lay, while so little agreement in opinion has been effected by them, in regard to final deductions and conclusions that, the earnest student is bewildered at the start, by much theory without result. Yet he cannot rid himself of the idea that, much theory and theoretical discussion is necessarily preliminary to, and forms with the practical application of naval grand tactics, an integral whole. One of the three indispensables to the accomplished naval tactical commander is, "a thorough knowledge of the theory of the topic, based on extended and faithful study."[1]

If we turn to history, and read there descriptions of the great sea-fights of olden time, we are met in every case, with so many peculiar surrounding circumstances, and find so few bearing any tactical resemblance, that we look in vain for some bright tactical light illuminating them, or even any one of them. Of course, that fine old method—"*En avant, mes gars*" adopted by brave men everywhere and in every age, and of a fire fast and furious, "board with a cheer," is common to them all; and indeed, this method, with the modification of a fire fast and *fatal*, must be our method to-day if we can make it so, notwithstanding changes in fashion of ships and guns.

But, while superior hard hitting will win, if started promptly, and while it has won in the past, despite bad management of the ships, we find in the history of the sea battles of about one hundred years ago, an artistic *touch*, if you please, given to the matter, before the hard hitting began. And since that time, this touch, though possibly unknown by name to its designers and followers, has never been forgotten or abandoned; its effectiveness has proved its worth.

We call it *concentration;* concentration of the whole of the

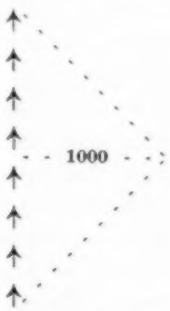
[1] Goodrich.

fighting strength upon a part only of the opposing force, or, of a greater part of the one upon a lesser part of the other; and, to obtain this concentration on the field of sea battle, so to speak, and to re-establish it if lost there, is the *one* aim of naval tactics.

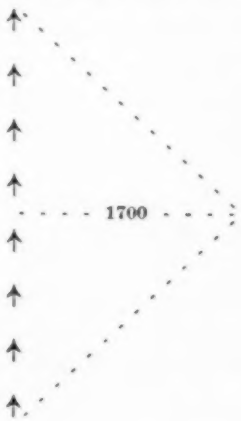
By this is not meant, of course, that other form of concentration, the concentration of one's own force before battle is joined, *i. e.*, the concentration of the line of battle itself.

Any system of battle tactics must mean a plan for strongly concentrating the units of the squadron—*massing* them to the extreme limit of tactical mobility, and then maneuvering all of these units together, simply, certainly, quickly.

Massing the units, permits concentration of fire within greater limits of range; thus, for example, with the units in column massed at 200 yards distance, the least range of greatest concentration of total fire is about 1000 yards.



If the distance were doubled, 400 yards, the least range of greatest concentration of total fire is increased to about 1700 yards.



The advantage of lessening the range of greatest concentration of total fire is evident, and suggests that of the "half Nelson" of boxing, the opponent's head under the arm.

It is fortunate indeed, that, having massed our units, we have but one thing to think about in the study of this subject of battle tactics, *i. e., concentration;* and not two, or three, or many things; for its attainment even in the course of theoretical study is found to be troublesome enough, however simple, at first sight, it may appear.

"War is a business of positions,"[3] and while this is true, and is readily recognized as true in a strategic sense, and on land, it is vitally true, tactically speaking, in naval war. When the forces there opposed are equal in strength and skill, the superior *position* of one must soon bring success to that side; but, having superior skill in hard hitting on the side of *position*, success for that side is inevitable, ready, and won at least cost to the winner.

Position as understood in these remarks, may be defined as the formation and bearing of the squadron, with respect to that of the enemy, by means of which, concentration of the whole squadron strength against a part of the enemy is effected. How to secure *position;* how to regain it if lost; or, how to rob the enemy of it quickly, should he by chance secure it himself, are the various problems to be wrought out, simplified and practiced by the fleet that is to be successful in war. And the study of this subject, though attractive to officers of all grades, must naturally win the special interest, and engage the serious attention of officers of the highest. For it is to them, whoever they may be at that hour, that all eyes will justly and promptly turn, when the summons comes in the future, as it has in the past, suddenly and sharply, to set forth the battle—*to fight to win!*

II.

It is believed that a comprehensive study of the tactics of the battle squadron divides itself, naturally, into elementary studies, sea evolutions, and battle practice.

Elementary studies comprise game board work, launch evolutions, and reading. Game board work is both theoretical and practical. It does not belong to the kindergarten study of the

[3] Napoleon.

subject, it is far beyond the "dotter" stage. It serves mainly, and very effectively indeed, to clear away false and flimsy ideas, to right conclusions; and it will ever remain the hand maiden of work on the water. It is a ready means of putting to test, under any carefully assumed conventions, the tactical plan the student may have in mind, and it is deemed rightly the only satisfactory way to make any real advance in the so-called theoretical study of naval tactics.

Solitary work is not commended. Little can be done with drawing board and scale; such work, at best, is laborious and slow, and it must be admitted that the solitary worker, like the solitaire card player, is apt to cheat himself—to drop into unrecognized error; it is only in *conference,* and in conference free and open that real work is done.

In well ordered, earnest work on the board, the worker controls his own hand only; he is there met by the straight leads of good tactics; the bold and true *finesse* of skillful feints, and must win or lose according to his tactical merit, for there is no taking back, or playing one's right hand against the left.

It will, in fact, be discovered that, after more or less prolonged and systematic work of this kind, an experience is gained which is genuine and lasting; such as the ability to discern the false from the true attack, or even to forecast, with a high degree of probability, the intention of the opponent; and it may even be found that an inspiration which makes for success later on in the battle practice, or perhaps in battle itself, is often but a recollection of a similar situation on the tactical board.

In this connection it is proper to note that an interesting and instructive adjunct of work on the tactical board is the critical and thoughtful examination of records of work previously done there; no other help, not even discussion, is so interesting, or aids so truly or economically in point of time, in getting out of the board all there is in it.

There are many doubters among sea officers as to the utility of a flotilla of evolution, and to such it may be stated that steam launch work goes hand in hand with study on the tactical board. Work with a single group of launches is mainly useful in demonstrating the *possibility,* or the *impossibility* of performance, of certain evolutions, on the water and with ships. It is not so much the question whether these evolutions can actually be performed

but whether they can be performed with any degree of certainty and precision; and, if so, how great is the danger from collision among the ships themselves, through a failure of one or more of the group to move correctly, and what precautions are suggested in the performance of these evolutions.

With two groups, *practicability*, or *impracticability* is established; that is to say, whether or not an evolution which has been found possible of performance, can be performed by one group in the presence of an equally active, skillful opponent represented by the second group, without receiving excessive punishment; punishment so great as to considerably outweigh the advantages gained in the object sought.

At this stage "special methods," so-called, transplanted from the tactical board, are wont to flourish with tropical vigor and freshness; but it is believed they will always wither, curl up and die from lack of stamina, when pitted against the simple plan in experienced hands. They are not of healthy growth, and after one or two trials, against the simple, certain, well found evolution, there is little left to remember them by. Nevertheless they will crop up again; the vain impulse to confuse the opponent by tactical legerdemain is too great to be resisted.

If this is agreed, it would be well to remember the fact in the more advanced studies, as an economizer of time and strength; not that the kindergarten should be forgot, but remembered only as happy play, its discovered errors and fancies leaving the mind freer, and stronger for the more strenuous work of the well formed plan on the board, in the flotilla, and in the sea evolutions of the squadron.

This *practical* work with launches—though there really is nothing more practical than the tactical board, in the true meaning of that word—involves necessarily, and to begin with, an infinity of detail and organization of *materiel;* then, a carefully wrought out scheme of boat control, involving the regulation of speed and helm, and specification of distance and interval in formation. In addition thereto, simple, roughly approximate methods of weighing the imaginary gun-fire must be determined; and, besides the customary rules for avoiding collision, special rules for the same purpose, must be established; such as limiting the maneuvering field of each of the opposing groups. All of this requires

considerable expenditure of money, time, and thought, but it is firmly believed that the end justifies the expenditure.

Torpedo fire should not be considered in the first trials.

To many, the similitude of the flotilla to the actual battle squadron may not appeal, or is even impossible of conception; but to such, it may be argued that, in any case, the time and effort spent is not wholly lost; the attention of all concerned in the maneuvers is drawn to the study of the subject, certainly, at least, while the exercise is in progress; and we cannot go far wrong on the water; and finally that, if *possibilities* of maneuver only are discovered by this means, a very great gain is made. Hard work, in a sense, it undoubtedly is, but being hard work it carries with it the high probability of yielding something worth the having, like every other kind of hard work.

So much may be said for the theory of, or the elementary study of naval tactics, the great object of which is to clarify thought, to rid the mind of error, to formulate ideas and to make possible, at least tentatively, the selection of a number of safe and sane evolutions, however small, which will then be valuable as *simple* and *certain* of performance, and if *based upon sound tactical elements,* therefore worthy of further study by the fleet.

Serious elementary study will, of course, embrace careful critical reading of the best accounts of the sea fights of history; and of important current literature, relating to the tactics of battle on the open sea, searching therein for the tactical principles employed; investigation of the curves made by the path of a ship turning under the influence of the rudder at varying helm angles; comparison of these paths for every ship of the line in service, with a view to the determination of a standing turning circle for battle; inspection of the paths of ships turning in company, either simultaneously or in succession, in order to obtain a knowledge of the possibilities of danger from collision during such turnings, and, should anyone go wrong, of the precautions that necessarily suggest themselves as a means to avoid such collision; when all this is done, we feel freer to approach the question of sea evolutions, and their bearing upon battle practice.

III.

Sea evolutions, that is to say, sea exercises, sea drills, must, of necessity, be considered in connection with battle practice; by which is meant the training of the squadron in a definite, precise plan, or plans for engaging the enemy under any but the most extraordinary circumstances.

The first is drill, pure and simple—not tactics at all—a means to an end, and that end smart tactics; a fact that must ever be kept in view during practice drills or sea evolutions.

The two are mutually dependent, in much the same manner as the "right and left moulinet" of broadsword exercise supples the joints and strengthens the muscles of the cutlass wrist and arm, so do sea evolutions give mobility and facility of movement to the units of the squadron, and hence to the squadron as a whole.

But, it must be remembered, these evolutions are not *tactics*, any more than the "moulinet" is an "attack," yet they are quite necessary, and necessarily preliminary to the safe and effective conduct of battle practice.

It will readily be agreed that the adoption of a form of attack, or of a plan of engagement involves the selection and lively practice of certain evolutions comprised within the plan adopted. Such evolutions as "ships right" or "ships left" indicate what is meant by this, and the continued repetition of these movements, for example, or the maintaining a steady grip on correct formation position, at high speeds, and during sudden changes of course, make up the sum and substance of sea drill.

Naturally, therefore, sea evolutions comprise mainly those movements that are supposedly useful in battle practice. To do otherwise, to bend the energies of the squadron to the nice performance of parade, or stately or complex movements, while these might indeed include, as the lesser within the greater, the practice of the simpler movements of battle practice, would be a foolishly uneconomical expenditure of time and money.

Our reading of history, and of recent naval history in particular, teaches us at least that, all battle practice movements are, beyond all else, *simple;* and that it is by *constant repetition in practice* of these simple movements that there is, in time, developed in controlling hand and eye, an almost unconscious readiness and ability of management.

To know exactly how to manage the ship in the execution of an evolution is one thing, to practice doing it, and doing it correctly is another.

I will quote here briefly from an accomplished and experienced sea officer,[1] who, writing upon the management of ships during sea evolutions, and commenting upon the proper performance of the very simple movement of a change of course in column, says:

"*After the leading ship or ship next ahead has put her helm over, the ship should be kept steady on the course, by compass, previously steered.*"

"It frequently happens that after the leading ship has put her helm over, the second ship steers for her stern (which is thrown out by the action of her helm), or even outside it; when this is done, the third and other ships following are almost obliged to follow her, for if they do not they will find themselves turning inside her circle, and coming up alongside her; as the fault always has a tendency rather to increase as it goes down the line, the turn becomes a serpentine movement ludicrous to behold."

"The ships when straightened out on the new course will also be very much astern of station because they travelled round a much larger arc than the leading ship, and this chiefly through the fault of a ship ahead of them."

In emphasis of the great importance this officer attaches to the *correct detail of performance* in this simple looking evolution, he continues:

"On board the second ship, if she is kept on the original compass course, it will look as if she were bound to turn inside the stern of the latter, but the next ahead soon draws clear, and by keeping each ship in a steady course, as the one ahead puts the helm over, every ship will be in position, soon after the helms are, righted to the new course."

There is nothing in this maneuver of changing course in column to be compared with in complexity to "change front to the right or left, by isodrome"; a maneuver familiar enough as affording choice opportunities for the successful operation of errors in judgment, and for hair-raising and hair-breath escapes,—beautiful in theory, impossible in practice, "*C'est magnifique mais, ce n'est pas la guerre.*" Yet this distinguished seaman dwells at length

[1] Commander R. N. Ommanney, R. N.

upon the *detail* of the performance of this simple evolution, apparently, in order to impress upon the mind the necessity of *correct* performance, and of the *continuously correct* performance of any evolution that is to be of use in battle practice; to the end that correct action may become a habit, a subconscious effort, an almost automatic action with all those whose business it is to manage speed and helm.

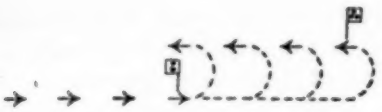
There are, of course, some maneuvers that certain arising circumstances of battle may make most valuable, as precisely suited to the situation; and, the contingency foreseen, a commander afloat may deem it wise to add such to his battle list; but it would seem that there cannot be many of these to find a place in the later stages of an engagement once begun.

We found in elementary studies that, *simplicity* and *certainty* in tactical evolutions are, first of all, essential to practicability; and we have found one reason for this to be that any attempt to maneuver the squadron in a manner intended to confuse the enemy is likely to result in real confusion to the maneuvering side. Still, the commander in battle practice must be, and is the sole judge as to the risk involved at the moment, in the employment of any of the more complex maneuvers; and he will decide, and must do so without hesitation, whether or no, in the fierce race for *position* that is going on, he is sacrificing to the attainment of *position* something else of very great importance. For example, the steadiness of his fire control, which must necessarily be shaken by any sudden changes in course.

In the use of his "end for end" maneuver at Tsushima, Togo did not hesitate to execute a movement which under more equal conditions he, perhaps, would not have been justified in attempting. At that time, apparently, his chief desire was to reverse the course of his squadron, change direction sixteen points; the sudden change of course of the Russian van making this necessary if the Japanese were to hold *position*. This maneuver may be put thus:

AT COMMENCEMENT OF MANEUVER.

1. Squadron in column heading East.



2. 1st Division "vessels left about" (1st phase).

3. 2d Division "vessels left about" (2d phase).

AT COMPLETION OF MANEUVER.

4. Squadron in column, heading West.

It will be noticed, from a glance at these sketches that, in the transposition of the divisions, the vessels of the rear and van, which would be, ordinarily, the most hammered, were relieved by those of the center; half of squadron fire was retained throughout the evolution, and the steadiness of fire control, which was bound to be interrupted by the great change in course, was impaired the least possible.

So, after all, although a "Tactical Signal Book" or a "Fleet Drill Book" may prescribe the nature and number of the sea evolutions, and the manner of performance of them; and, while, indeed continued practice with them all might work wonders in improving the mobility and flexibility of a squadron, yet the question will arise, are these things the very things the commander of the squadron desires in the effective execution of his tactical battle plan.

If not, he will discard the complex, the grotesque, and the unfit, and adopt those best suited to his best needs, into his hand book of sea maneuvers.

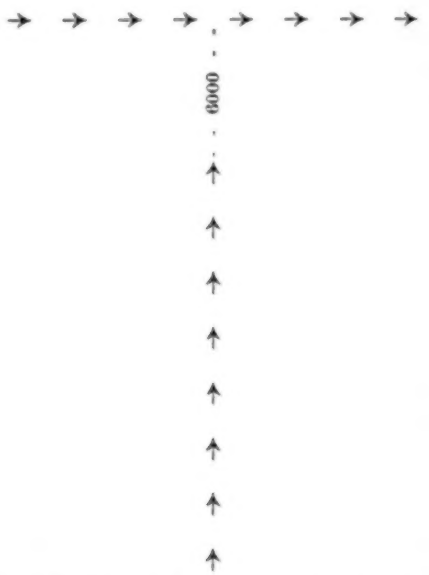
It is not infrequent to hear someone desirous of getting ahead in the study of naval tactics, enquiring for some "*vade mecum*," some royal road to knowledge on this topic. Has no one written anything complete on this subject? We hear him say: "Can we not get this thing down so fine that, the next move on the field of battle practice will be like the next move in chess, apparent to the experienced player?"

I believe that we can approach that condition of things by thoughtful study on the tactical board; work in the flotilla, and critical observation of much battle practice.

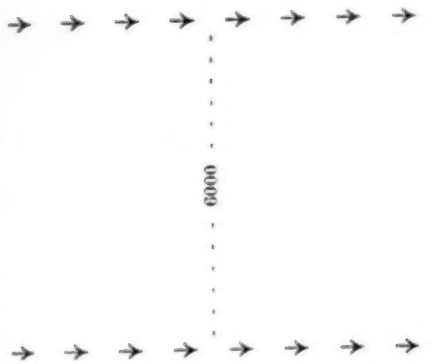
In the matter of the battle practice I submit with deference the proposition; would it not be instructive to assume certain positions for opposing squadrons; that is, to take from the tactical board certain situations, assuming them to be those into which two such squadrons, a few minutes after beginning an action, would find themselves; the problem being to secure *position* within a certain specified time.

In the game of tennis, for example, players take established position to begin with, changing over, perhaps, during the series, or "set," so as to equalize position advantage; that is, to eliminate from the game the effect of inequalities of ground, position of sun, direction of wind, etc. Certainly, in this game, although the positions are the same at the beginning of every game, an endless variety of moves are suggested during the play, and tactical skill in taking position is splendidly exercised.

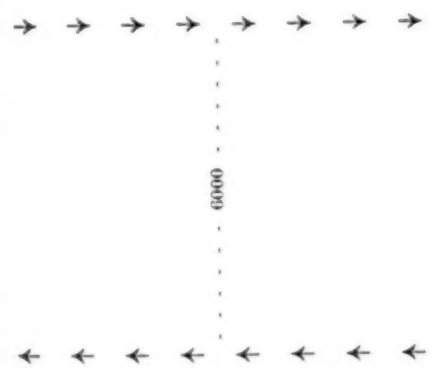
Instead of one position to begin with, let us select say three, such as these:



POSITION I.—*Ideal* Position: ideally good for the cross, ideally poor for the stem of the T.



POSITION II.—Advantage Equal.

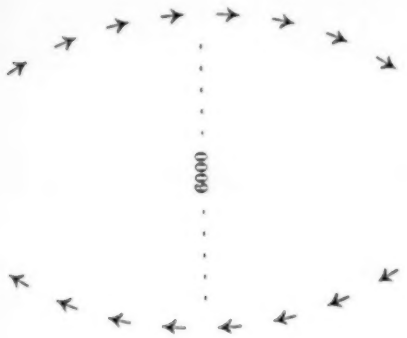


POSITION III.—Advantage Equal.

Of course, exact positions such as these would not be at all necessary, modifications of these might be used, thus:

POSITION IV.

POSITION V.



POSITION VI.

Whichever might be agreed upon.

Thus, starting over and over again, squadron against squadron, carefully noting maneuvers for subsequent comparison, a battle practice is obtained from which, I submit, some valuable tactical data must be obtained.

I know of no such set work as this, in any service, and naturally enough do not know the views, or intentions of any of our own fleet commanders, hence in the words of the essayist, "I am untrammelled by official secrets and unrestrained by the blighting fear of revealing anything." I am convinced, however, that any further light to be obtained on naval tactics, must be had from work upon the waters, the results of the experience of our own commanders. "It is evident that the standpoint from which the scheme of naval tactics must be developed is the standpoint I have indicated—that of the commander-in-chief; because it is from that standpoint that our next battle will be directed."

"Unless we approach the subject from this side," we must either remain in our present state of unreadiness or begin a period of aimless, expensive, and highly dangerous groping in the dark."[4]

It would indeed be gratifying if the result of such "battles of wits," was to throw real light upon Battle Tactics of the Squadron.

[4] Goodrich.

DISCUSSION

For the Broader Study of Tactics.

(See No. 118.)

Captain A. C. Dillingham, U. S. Navy.—In the plea of Rear-Admiral Goodrich for a broader study of tactics, he has the sympathy of many officers of experience, or rather, we should say, long service.

The tactics of formation is indispensable, but such tactics come with a knowledge of captains of ships, of the tactical value of their vessels.

The captain of a ship knowing the tactical qualities of his vessel, it is only necessary for the division commander or squadron commander to standardize the vessels of his command, and tactics of formation should be complete.

We must get beyond the tactics of formation to learn battle tactics. Admiral Barker once for an hour, under the direction of the Admiral of the Navy, did attempt battle tactics on a very limited scale, by maneuvering six battleships against four cruisers. At this exercise there were no battle conditions, but it was an exercise for the benefit of the two rear-admirals engaged. I do not know what the present commander-in-chief of the Atlantic Fleet has done or contemplates doing, but I do know that the service has great confidence in his ability as a sea officer to get results.

The delay in doing battle work with divisions or squadrons has been due, first, to the delay in getting separate vessels under the flag.

A vessel going in commission should join the flag as soon as possible after her captain has obtained the tactical data of his vessel; the school of the ship coming with "tactics of formation."

With the "tactics of formation" complete, the answers to Admiral Goodrich's question can only be given when we have had actual practice in handling for battle the material that we have at our disposition.

The question is not "Has the fleet the analogues of cavalry, the signal corps, the skirmish line, or the commissariat?" but "What will the admiral do with what he has?" The judgment of the commander-in-chief cannot be analyzed or studied, until he has taken action with what material he has at his disposal.

I think we can predict that methods of signaling, fire control, external communications, battery arrangements, armor distribution, range finding, etc., will affect the judgment of the commander-in-chief, by just the amount of confidence that he has in these adjuncts of efficiency; and, furthermore, we will never know what the commander-in-chief will do with the analogues of cavalry, the signal corps, the skirmish line, and his commissariat, till he has had them ready to move in accordance with his judgment. Admiral Goodrich's standpoint, from which the scheme

of naval tactics must develop, is, I believe, correct—that of the commander-in-chief, and in approaching the subject from Admiral Goodrich's side, we should have, first, the school of the ship, which is learned in the "tactics of formation," and, second, the school of the commander-in-chief, which is nothing more than assembling such material as he may have, and the practical handling of this force under conditions as nearly as possible those of actual war.

With the material assembled, strategical study is at the disposition of the commander-in-chief, the tactical results can only be gotten by dividing the fleet, and allowing one flag officer to operate against another under war conditions.

I think the people who attempt to write grand, or battle tactics, are liable to impress the student with the great depth of something they are seeking, whereas such tactics is the practical handling of the forces at one's disposal.

Naval history convinces us of certain axioms in handling large numbers of vessels against an enemy; with these axioms known and appreciated, it becomes a question in battle which commander-in-chief is going to get the advantage. I believe it would be safe to say, that the commander-in-chief who has had the greatest actual amount of practical experience in handling one force against another in time of peace, under as nearly as possible war conditions, will win.

It was once thought that it would require months for a vessel just commissioned, before she was fit to join the flag. I believe it is accepted now, that the sooner the vessel joins the flag, the better. It only requires that the captain shall have gotten the tactical data of his vessel.

It may before long be decided that it is best for the commander-in-chief to begin battle tactics as soon as possible after the division commanders have standardized the vessels of their commands, and the commander-in-chief has organized the units of his fleet.

The judgment of any commander in time of war, who has not had actual practical experience in time of peace, in conducting battle maneuvers, will be snap judgment. We cannot make battle tactics; we must do them, and this brings the question with us, Have we the flag officers in grade long enough, to do the necessary amount of practical work, to bring effective knowledge; or, if we have such flag officers, do enough of them have the opportunity of getting such practical knowledge, in order to give us sufficient flag officers in time of war? Admiral Goodrich, for instance, has been afloat, but with such a command that his opportunities for studying battle tactics were few. If he now becomes the superintendent of the Naval Academy it will end his career as a fleet commander, although he has yet three years to serve.

The Board on Navy Personnel may recommend such legislation as will give us flag officers who will be long enough in the grade to be of practical use to the service; but in this connection it can be said that not all flag officers possess the natural gift or talent for handling large forces opposed to each other. Under such circumstances it would seem to be for the best interest of the service to employ only such officers for

battle work who do possess the talent or gift; the others no doubt have talents for administering at naval stations, naval academy, etc.

If our flag officers have the opportunities for the practical handling of large forces against each other under battle conditions, the captains will learn, and be ready to take their places when required.

Without a satisfactory interview with Togo, it is impossible to know what he had in mind when the "ball opened," but it is fair to say that his previous experience to the north'ard stood him in good service at the battle in the Sea of Japan.

Togo had been careless to the north'ard, but he came to the south'ard with that experience, and I have no doubt that at the great fight at the Sea of Japan, Togo was much gratified upon observing that the Russian commander had neglected the axioms taught by naval history, and the results of Togo's practical experience, which gave to him the practical knowledge of the forces under his command, allowed him to take advantage of the defects of his enemy.

The great thing that Togo had in mind at the battle of the Sea of Japan was that he was going to lick his enemy, and seeing the weak points of the enemy's formation, he hastened to take advantage of them.

We can throw some light on the "mental processes" of Togo's mind, and explain to a certain extent what he had in mind, if we will put ourselves in Togo's place, and imagine that we are waiting for information as to the disposition of the enemy's force.

It is probable that Togo felt a self-confidence, gained by his practical experience, which allowed his mind to remain tranquil till the necessary information was obtained; then his practical experience, with his natural talent for handling large forces, allowed him to act promptly and effectively.

With the details of fleet organization complete, and effective, battle tactics can only be studied by the actual handling of forces under battle conditions.

Presumably it is the duty of the commander-in-chief to satisfy himself that the adjuncts to fleet efficiency are efficient, and the best possible. If battle signals are not satisfactory, if the tactical signal book is not complete, then they must be taken up at once, and made as satisfactory as possible, in order to get the best results from battle tactics.

With battle maneuvers, like any other problems, the simpler and fewer the details, the less is on the mind of the responsible leader, and the success of the commander-in-chief depends, as does that of the head of any great organization, greatly upon the men he has about him; in civil life the success of a leader will depend greatly upon the character of the men he has associated with him, so with a commander-in-chief, his success will depend in a large measure, upon the character of his subcommanders, and his captain, and for this reason, should the commander-in-chief at any time find his assistants lacking, he must straightway remedy the obstruction to success, the same as he would perfect his signal and tactical book, in which case he would eliminate the useless, and keep that part which will be of use.

PROFESSIONAL NOTES.

Prepared by Professor PHILIP R. ALGER, U. S. Navy.

SHIPS OF WAR, BUDGETS, AND PERSONNEL.

AUSTRIA.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships.			
Erzherzog Friedrich	10,600	Trieste.	Under trial.
Erzherzog Ferdinand-Max	10,600	"	Building.

The budget of the Austro-Hungarian Navy for the present year amounts to 30,897,410 crowns, but there is in addition a sum of 1,950,000 crowns arising from a vote from the previous year, as well as certain votes of 1904 intended for the building of the new class of battleships. The *Erzherzog Friedrich* will soon be completed, and the *Erzherzog Max* is well advanced. Five destroyers and thirteen torpedo-boats are in hand at Trieste, and six of the former and ten of the latter are to be built at the new Danube establishment to be opened at Fiume. No votes are asked for large new construction, but next year it will be necessary to lay down vessels to replace the old *Rudolf*, *Stephanie*, and *Tegetthoff*. The chief of the navy is in favor of battleships of at least 14,000 tons, and says that armored cruisers are necessary only for the greater navies. The plans are ready for submarines, and some will be put in hand as soon as possible.—*Army and Navy Gazette.*

FRANCE.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships			
République	14,865	Brest.	Under trial.
Démocratie	14,865	"	Launched May 2, 1904.
Patrie	14,865	La Seyne.	Under trial.
Justice	14,865	"	Launched Oct. 27, 1904.
Verité	14,865	Bordeaux.	Building.
Liberté	14,865	St. Nazaire.	Launched April 19, 1905.
Danton	18,000	Brest.	Ordered.
Mirabeau	18,000	Lorient	"
Voltaire	18,000	"	To be begun in 1906.
Diderot	18,000	"	" " " " "
Condorcet	18,000	"	" " " " "
Vergniaud	18,000	"	" " " " "
Armored Cruisers.			
Ernest Rénan	13,644	St. Nazaire.	Launched April 9, 1906.
Jules Michelet	12,550	Lorient.	" Aug. 31, 1905.
Victor Hugo	12,550	"	Under trial.
Edgar Quinet	13,644	Brest	Building.
Waldeck Rousseau	13,644	Lorient	"

THE NAVAL ESTIMATES.—The French Navy estimates have just been issued, and the memorandum accompanying them shows that the authorities in Paris have no intention of relinquishing the policy upon which they embarked some months ago to bring their fleet into line with modern requirements. For new construction the vote for 1907 is to be four and a half millions sterling, made up of 2,134,640*l.* for battleships, 869,188*l.* for cruisers, 526,216*l.* for torpedo-boat destroyers, 670,832*l.* for submarines, and 69,648*l.* for torpedoes. This enables progress to be made with ten

battleships, four armored cruisers, twenty-seven torpedo-boat destroyers, and fifty-seven submarine and submersible boats, making a total of ninety-eight on the list of ships building. Of this total, twenty-six vessels will be completed during 1907, including four battleships, one armored cruiser, twelve destroyers, and nine submarine boats. The principal work to be continued includes the six new battleships of 18,000 tons displacement now being laid down. This tonnage is a considerable advance on any preceding French battleship—the vessels of the *Patrie* class, now being completed, have a displacement of 14,635 tons; and there is an even greater advance in cost, as the armor is not only thicker and more widely distributed, but the ships will carry four 12-inch and twelve 9.4-inch weapons, as compared with four 12-inch and eighteen 6.4-inch guns in the *Patrie* type. We have already referred in detail to the armament of these ships, and we may now confine ourselves to the remark that the French authorities have evidently not been afraid of the enormous sums involved in these vessels. The two dockyard-built ships will each cost 1,803,300*l.*, of which one-sixth is required for artillery, while the four vessels to be given out to contract are estimated to cost slightly over 2,000,000*l.* each. These six battleships are to be completed in 1910.—*Engineering.*

NEW BATTLESHIPS.—Orders have been received at Brest and Lorient for the laying down of the two new 18,000-ton battleships, *A16* and *A15*, respectively; the remaining four are to be built in private yards. All six ships are to be completed within four years. Their characteristics, which haave now been finally approved by the Minister of Marine, are as follows: Length, 475 feet 7 inches; beam, 84 feet; draft, 27 feet 6 inches, with a displacement of 18,000 tons. The armament will consist of four 12-inch guns in two turrets, one forward and one aft; twelve 9.4-inch guns in pairs in turrets, three on each broadside; sixteen 12- and eight 3-pounders, with two submerged torpedo-tubes. The engines are to develop 22,500 I. H. P., giving a speed of 19 knots. Details of the armor have not yet been published. The cost of each ship will be 47,851,558 francs (£1,914,062), of which it is proposed to spend 2,717,340 francs (£108,693) during the present year. The ships are to be called the *Voltaire, Diderot, Condorcet, Vergniaud, Mirabeau,* and *Danton.—United Service Institution.*

THE NAVAL MANEUVERS.—Admiral Fournier will this year again hoist his flag on the first-class battleship *Brennus*, the flagship of Rear-Admiral Germinet, commanding the Reserve Division of the Mediterranean Fleet, and has selected Captaine de Vaisseau Chocheprat as his chief of the staff, who served in the same capacity under him last year. In addition to the Mediterranean Active Squadron and Reserve Division, and the Squadron of the North, a division of ships in reserve at Toulon has also been mobilized, and will take part in the maneuvers, composed of the following vessels:

Coast-defence battleships—*Caïman, Indomptable, Requin.*
Third-class cruiser—*Alger.*

This division will be commanded by a Capitaine de Vaisseau. Admiral Fournier will also have at his disposal for the different operations on the coast the five flotillas of the Mediterranean, of which the offensive divisions have been mobilized. The crews of the Reserve Division and of the mobilized ships will be completed to an active service footing, and the reservists, who were called out on the 2d inst., will complete the vacancies, those not required for this purpose being borne as supernumeraries in different ships; the reservists are to be disembarked on the 26th inst. at Toulon, but the fleet will not be dispersed until August 4. The following is the official program:

July 3.—Maneuvers commence, the three squadrons taking up their positions at the points already indicated.
July 5.—Concentration of the fleet at sea.

July 6.—Arrival of fleet at Algiers, coaling.
July 7.—Coaling.
July 8.—Leave Algiers.
July 9 to 13.—Tactical exercises, battle exercises, and regular fleet drills.
July 13.—In the morning the Squadron of the North will anchor at Philippeville, the Mediterranean and Reserve Squadrons at Bône. Partial coaling.
July 14 and 15.—Remain at anchor off these two ports.
July 16.—Weigh at daylight, re-concentration of fleet. Night exercises with torpedo-boats and submarines from Bizerta.
July 17.—Arrival at Bizerta.
July 17, 18, and 19.—Coaling.
July 20.—Proceed to sea.
July 21.—Attack on Bizerta.
July 22.—Anchor off Bizerta.
July 23.—Proceed to sea. Scouting, boom and firing exercises.
July 26.—Return to Toulon during night of 26-27.
July 28-30.—Remain at Toulon, coaling.
July 30.—Proceed to sea at night.
July 31 to August 3.—Tactical exercises.
August 3.—Return to Toulon.
August 4.—Break up of fleet.

This is the last year Admiral Fournier will command the fleet, as he has to retire for age next May; and the question is already being asked as to who will succeed this distinguished officer, as the head of the fleet. It is believed that Vice-Admiral Caillard, who is only sixty, and has thus five years more to run, and who last October vacated the appointment of commander-in-chief of the Northern Squadron, will be the officer selected.—*United Service Institution.*

Admiral Fournier has been describing to a contributor to the *Moniteur de la Flotte* the character of the French naval maneuvers. He says there are three kinds of maneuvers, of which we have been practicing that best suited to our situation, very costly in the matter of coal. The French have in previous years adopted that class of maneuvers which they describe as of "double or triple action"—that is, in which two or more squadrons are engaged in maneuvers which lead up to fleet actions. The maneuvers of the present year are not much concerned with the operations that precede such actions, and Admiral Fournier appears to be devoting attention chiefly to the battle tactics of fleets on a large scale, and says that the tactics of single squadrons or divisions may follow. He regards the division as the tactical unit, a unit which is to follow implicitly the movements of its leader, and this leader will regulate his movements by those of the admiral in command of the squadron. Admiral Fournier says that this simplification in the organization of a fleet enables it to be maneuvered without signals and without compass, which cannot be done if ships are to alter course together. He seems, therefore, to base his tactics upon the line ahead. To this tactical principle the admiral joins the rule that each vessel is to fire upon the ship of the enemy nearest to her, and inasmuch as the distance between the divisions is to be considerable, one ship cannot mask the fire of the other. In the French maneuvers of the present year the national forces are represented by a fleet composed of three squadrons, each of six battleships, while the enemy is represented by small cruisers and destroyers capable of forming a line as long as that of the battleships. Thus is being put in force in a practical manner the new system of tactics introduced last year in the Mediterranean Squadron, but which has been applied ever since in the various squadrons, and has been codified in the volumes of tactical regulations now in possession of the captains of vessels. If this statement is correct, the line abreast and line of bearing would appear to have been abandoned.—*Army and Navy Gazette.*

In the French naval maneuvers there were no accidents or breakdowns of importance and the crews behaved admirably. The system of tactics introduced was under trial. It is based on the principle that from the very commencement of a naval battle the smoke from the guns will prevent the commander-in-chief's signals from being seen with any degree of certainty, while the vibrations set up by the discharge of heavy artillery affect the compasses and render them useless for navigation. Hitherto the French fleet has practiced a series of fleet movements and battle formations to be directed by the admiral. According to Admiral Fournier, it is practicable to carry out certain rules—such, for instance, as to concentrate one's fire on the nearest enemy—which will enable each commander to co-operate in the admiral's scheme without being dependent on the flagship for signals in the course of the encounter. The putting of these theories into practice led to sundry misunderstandings and a great deal of the signalling is supposed to be avoided; but it is probable that when commanders become more familiar with the new idea signals will become less and less frequent. The system will undoubtedly undergo many modifications. Admiral Fournier himself does not regard it as by any means perfect, and is on the alert for suggestions which may improve it. Only prolonged trials can show whether it is of real value. In an interview published by the *Matin*, Admiral Fournier said he did not pretend that everything was for the best in the best possible of navies; but he was able to say that the fleet then moored in Toulon Harbor had gone through a long series of complicated maneuvers without a breakdown, that the preparation of the ships of the Reserve for sea was carried out with exceptional speed, and that the taking in of coal and provisions was conducted very satisfactorily.—*Army and Navy Gazette.*

Admiral Fournier certainly does not regard the French naval maneuvers which have just concluded as marking the downfall of the battleship, as some have supposed. On the contrary, he declares the battleship to be essential for all offensive action, while for defence he assigns a very high value to the destroyer and the submarine. In relation to the tactics and the maneuvering without signals, there is a remarkable article in the *Moniteur de la Flotte* by M. Pierreval. This writer remarks that the best formation theoretically is the line ahead, provided the ships forming the line are not too numerous. Admiral Gervais' plan was to shorten the line by doubling it, but in so doing he ran the risk of having the fire of some ships masked. Therefore, by training and other formations, it was endeavored to keep the ships massed, while avoiding the dangers which the massed formation presented. M. Pierreval says his criticisms of these formations were favorably considered by Admiral Gervais. He now argues that the idea of grouping ships in masses visible to the admiral and controlled by him, is dangerous, because it leads to the doubling and then the tripling of the line, in what we take to be formations in sections in quarter line. He says that the plan of maneuvering without signals arose from this maneuvering in close order, and was not the cause of it. Admiral Fournier, in his lecture to his officers, spoke highly of the advantage of a fleet maneuvering *à vue*, the course of the action developing according to simple rules to which officers would have been habituated in peace operations, while the adversary would be in disorder, powerlessness, and confusion. He thus assigned great moral superiority to a fleet maneuvering in close order without signals. But M. Pierreval thinks the difficulty of signalling has been exaggerated, and that massed formations are not justified to make it possible. Evidently his view is in favor of different squadrons in line ahead, each operating upon the initiative of its commander in execution of a plan previously determined by the admiral in chief command.—*Army and Navy Gazette.*

GERMANY.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships.			
Pommern	13,200	Stettin.	Launched Dec. 2, 1905.
Hannover	13,200	Danzig (Schichau Works.)	" Sept. 26, 1905.
Q	13,200	Kiel.	Building.
Schlesien	13,200	Danzig.	Launched May 28, 1906.
Ersatz Bayern	19,000	Wilhelmshaven.	Ordered.
" Sachsen	19,000	Kiel.	"
Armored Cruisers.			
Gneisenau	11,600	Bremen.	Building.
Scharnhorst	11,600	Hamburg.	Launched March 22, 1906.
E	15,000	Kiel.	Ordered.
Protected Cruisers.			
Danzig	3,200	Danzig.	Launched Sept. 23, 1905.
Koenigsberg	3,200	Kiel.	" Dec. 1905
Leipsig	3,200	Bremen.	" Mar. 22, 1905.
O	3,400	Danzig.	Building.
Ersatz Wacht	3,400	Stettin.	"
" Blitz (Nürnberg)	3,400	Kiel.	Launched Aug. 28, 1906.
" Pfeil	3,500	Dantzig.	Building.
" Komet	3,500	Stettin.	"

THE NAVAL ESTIMATES.—The estimates for 1906 amount to 253,456,685 marks (£12,672,834 5s.), as against 235,618,205 marks (£11,780,910 5s.) voted for 1905, showing an increase of 17,838,480 marks (£891,924 10s.). The following are the principal items:

ORDINARY PERMANENT ESTIMATES.

	Proposed for 1906. Marks.	£	s.	Voted, 1905. £	s.
Imperial Ministry of Marine and Naval Cabinet	1,793,210	= (89,660	10)	82,498	10
Naval Headquarter Staff	332,060	(16,603	0)	11,898	5
Observatories, etc.	356,384	(17,819	4)	17,986	4
Station Accounts Department	578,900	(28,945	0)	23,552	0
Legal Department	168,800	(8,440	0)	7,111	0
Chaplains' Department and Garrison Schools	135,076	(6,753	16)	5,598	2
Pay of Officers and Men	27,045,944	(1,352,297	4)	1,213,772	12
Maintenance of Fleet in Commission	28,630,460	(1,431,523	0)	1,334,534	5
Allowances for Officers and Men	2,065,304	(103,265	4)	87,157	18
Clothing	412,358	(20,617	18)	19,817	13
Barrack and Garrison Administration, etc.	1,493,255	(74,662	15)	68,807	10
Lodging Allowance	2,268,260	(113,413	0)	185,123	3
Medical Department	2,111,857	(105,592	17)	91,332	19
Travelling, Transport and Freight Charges	3,446,000	(172,300	0)	166,850	0
Training Establishments	404,987	(20,249	17)	20,208	8
Maintenance of Fleet and Dockyards	28,057,074	(1,402,853	14)	1,321,694	6
Ordnance, Arms, and Fortification	10,318,608	(515,930	8)	463,922	18
Accountant-General's Department	873,290	(43,664	10)	36,730	13
Pilotage and Surveying	709,296	(35,464	16)	33,801	10
Miscellaneous Expenses	1,498,885	(74,944	5)	65,766	14
Administration of Kiau-Chau Protectorate	102,027	(5,101	7)	4,818	15
Total	112,802,035	(5,640,101	15)	5,263,037	15

SPECIAL ORDINARY ESTIMATES.

Shipbuilding Program for 1906.

For the construction of the following ships:

	Marks.	£ s.
The first-class battleship *Lothringen* (*M*), 4th and final vote	2,350,000	= (117,500 0)
The first-class battleship *Deutschland* (*N*), 4th and final vote	2,350,000	(117,500 0)
The first-class battleship *O*, 3d vote	4,650,000	(232,500 0)
The first-class battleship *Hannover* (*P*), 3d vote	4,650,000	(232,500 0)
The first-class battleship *Q*, 2d vote	6,050,000	(302,500 0)
The first-class battleship *R*, 2d vote	6,050,000	(302,500 0)
The first-class battleship Ersatz *Bayern*, 1st vote	3,000,000	(150,000 0)
The first-class battleship Ersatz *Sachsen*, 1st vote	3,000,000	(150,000 0)
Mine-ship *A*, 2d and final vote	1,000,000	(50,000 0)
The first-class armored cruiser *C*, 3d vote	4,270,000	(213,500 0)
The first-class armored cruiser *D*, 2d vote	5,030,000	(251,000 0)
The first-class armored cruiser *E*, 1st vote	3,000,000	(150,000 0)
The third-class cruiser *Leipzig* (*N*), 3rd and final vote	1,090,000	(54,000 0)
The third-class cruiser *Danzig* (*Ersatz Alex-..andrine*), 3d and final vote	1,090,000	(54,500 0)
The third-class cruiser Ersatz *Meteor*, 3d and final vote	1,090,000	(54,500 0)
The third-class cruiser *O*, 2d vote	2,435,000	(121,750 0)
The third-class cruiser Ersatz *Wacht*, 2d vote	2,435,000	(121,750 0)
The third-class cruiser Ersatz *Blitz*, 2d vote	2,435,000	(121,750 0)
The third-class cruiser Ersatz *Pfeil*, 1st vote	1,230,000	(61,500 0)
The third-class cruiser Ersatz *Comet*, 1st vote	1,230,000	(61,500 0)
For the construction of a Tender for the Artillery School in Sonderburg	450,000	(22,500 0)
For the construction of a Mine-ship *B*, 1st vote	1,000,000	(50,000 0)
For construction of Division Torpedo-boats, 2d and final vote	2,440,000	(122,000 0)
For construction of Two Divisions of Torpedo-boats, 1st vote	8,000,000	(400,000 0)
Fitting-up of a first-class battleship of the *Sachsen* class as a Torpedo schoolship	150,000	(7,500 0)
Improvements to the first-class armored cruisers *Hertha* and *Victoria Louise*, 1st vote	500,000	(25,000 0)
Construction of and experiments with Submarines	2,500,000	(125,000 0)
Total	73,475,000	(3,673,700 0)
For the Gun and Torpedo Armaments of New Ships, and Mines	35,725,000	(1,786,250 0)
Miscellaneous Expenditure: Dockyards, etc.	7,064,650	(353,232 10)
	116,264,650	(5,813,232 10)
From which has to be deducted, credited in the Extraordinary Estimates	27,575,000	(1,378,750 0)
Leaving Total	88,689,650	(4,434,482 10)

Summary.

	Marks.	1906. £	s.	1905. £	s.	Increase, 1906. £	s.
Ordinary Permanent Estimates	112,802,035	= (5,640,101	15)	5,263,037	15	(+377,064	0)
Shipbuilding Armament, etc.	88,689,650	(4,434,482	10)	4,171,422	10	(+263,060	0)
Extraordinary Expenditure	51,965,000	(2,598,250	0)	2,346,450	0	(251,800	0)
Total	253,456,685	(12,672,834	5)	11,780,910	5	(+891,924	0)

THE PERSONNEL OF THE FLEET.—The following are the numbers of the officers of different ranks on the active list of the fleet: 1 grand admiral, 6 admirals, 4 vice-admirals, 15 rear-admirals (a total of 26 flag officers), 71 captains, 151 frigate and corvette captains, 349 captain-lieutenants, 874 lieutenants, 378 midshipmen, and 175 naval cadets.

There are, further, 2 retired rear-admirals, 9 retired captains, 20 retired frigate and corvette captains, and 5 retired captain-lieutenants employed on special duties, while 44 captain-lieutenants and 73 lieutenants are employed in ordnance and torpedo duties in the various dockyard and coast stations.

The total number of commissioned officers of the military branch actively employed is thus 1470, as against 1370 last year, being an increase of 2 rear-admirals, 4 captains, 3 frigate or corvette captains, 50 captain-lieutenants, and 41 lieutenants.

The Engineering Department consists of: 8 chief engineers or senior staff engineers, 43 staff engineers, 85 senior engineers, and 131 engineers, being an increase of 1 chief engineer or senior staff engineer, 5 staff engineers, 7 senior engineers, and 13 engineers over last year.

The Staff of the Marine Battalions is as follows: 1 inspector of marine infantry, 2 battalion commanders, 13 captains, 12 first lieutenants, and 22 lieutenants, being the same establishment as last year.

The Medical Department consists of: 1 medical director-general (with the rank of rear-admiral), 4 inspector-generals, 44 fleet-surgeons, 79 staff surgeons, 46 surgeons, and 47 assistant-surgeons, being an increase of 5 fleet-surgeons, 3 staff-surgeons, 2 surgeons, and 3 assistant-surgeons over last year.

In the Accountant Department are 31 staff paymasters and 149 senior paymasters and paymasters, being an increase of 3 staff-paymasters and 6 paymasters over last year.

The Seaman's Divisions number: 111 chief warrant officers, 183 warrant officers, and 16,175 petty officers and men, with 48 boys' instructors and 1052 boys, a total of 17,569, showing an increase of 11 chief warrant officers, 16 warrant officers, and 1086 petty officers and men, the number of boys and their instructors remaining the same.

The Dockyard Divisions number: 313 chief warrant officers, 625 warrant officers and 11,735 petty officers and men, of whom 833 chief and warrant officers and 9585 petty officers and men form the engine-room *personnel* of the fleet, which shows an increase of 49 chief and warrant officers and 670 petty officers and men over last year, with a total increase in the divisions of 50 chief and warrant officers and 754 petty officers and men.

The Torpedo Divisions number: 92 chief warrant officers, 185 warrant officers, and 4659 petty officers and men, of whom 52 chief and warrant officers and 2146 petty officers and men are of the seaman class, while 225 chief and warrant officers and 2513 petty officers and men are of the engineering branch. There is an increase in the divisions of 17 chief and warrant officers, and 234 petty officers and men of the engineering branch, and of 4 chief and warrant officers and 168 petty officers and men of the seaman branch, or a total increase in both branches of 21 chief and warrant officers and 402 petty officers and men.

The Seaman-Artillery Division numbers: 12 chief warrant officers, 24 warrant officers, and 2899 petty officers and men, showing an increase of 1 chief warrant officer, 1 warrant officer, and 149 petty officers and men over last year.

The Marine Infantry numbers: 191 non-commissioned officers and 1098 men—a similar strength to last year.

The Sick Bay Staff consists of: 438 petty officers and men of various grades, being an increase of 98 over last year; and there are 330 ships' stewards, writers, and assistants.

The sum total of all ranks is 43,474, being an increase of 2802 compared with 1905:

Personnel.	Officers.	Non-commissioned Officers and Seamen.				Total all Ranks, 1906.	Increase compared with 1905.
		Warrant Officers.	Petty Officers.	Seamen.	Boys.		
Naval Officers.....1,470 Pensioned Officers.... 41	1,511	....	...	....	....	1,511	102
Junior Executive Officers....	....	....	378 M'shipmen	175 Cadets	....	553	23
Engineer Officers	269	....	....	....	....	269	26
Paymasters.....	180	....	....	....	....	180	....
Seamen, Boys, Dockyard and Torpedo Divisions.....	....	1,509	7,525	25,044	1,100	35,178	2,349
Seamen Artillery..... ..	....	36	336	2,563	....	2,935	131
Marine Infantry.....	50	....	191	1,033	....	1,274	....
Personnel of the Clothing Department.....	....	....	25	200	....	225	1
Medical Department	221	....	184	359	....	664	111
Artillery Administration....	74	99	56	....	....	229	16
Torpedo *Personnel* (Technical and Administrative)..	46	107	46	....	....	199	11
Mining *Personnel* (Technical and Administrative).....	19	29	44	....	....	92	7
Accountant Department.....	....	75	200	42	....	317	12
Surveying "	....	28	....	....	....	28	....
Total.....	2,370	1,883	8,985	29,316	1,100	43,654	2,802
		41,284					

—*Etat für die Verwaltung der Kaiserlichen Marine auf das Rechnungsjahr, 1906.*—(Translation from *United Service Institution.*)

THE NEW BATTLESHIPS.—The new German battleships promise to be exceptionally powerful; it is intended, according to latest reports, to fit sixteen guns of 11-inch bore and 50 calibers in length. These guns will therefore be the longest modern weapons fitted on board ship, their length being 45 feet 10 inches, as compared with the 45 feet in the new 12-inch guns in the British ships. The difference is small, and it will not be possible to make a definite comparison of ballistics, and notably of the striking energy, until we know the pressure and velocity aimed at. In view of this we cannot estimate fully whether the increased number of weapons, as compared with the ten 12-inch guns in the *Dreadnought*, is sufficient advantage for any reduction in smashing effect that may arise by reason of the less caliber of each gun. The Germans, it is understood, have decided not to seek for the high speed aimed at in the

Dreadnought, because speed is an important element in increasing displacement and cost. There is, however, no question that in tactical exercise higher speed offers material advantages. It is understoood also that there will not be the same need for an extended radius of action. The allowance for coal supply has been reduced. Notwithstanding this, however, the displacement of the German ships is 19,000 tons, and there is every probability that their cost will be quite 2,000,000*l*, a fact which in itself, apart altogether from the number of ships to be laid down, proves that Germany is determined not only to profit by the experience of the British Admiralty, as embodied in the design of the *Dreadnought*, but to have, at as early a date as possible, a homogeneous fleet of vessels, each, in their opinion, equal to our new leviathan. The Germans are also maturing their scheme for armored cruisers, embodying the ideas introduced in our *Invincible* class, so that the Government and Admiralty at Berlin are not in any way disposed to accept the lead of the British Government towards retrenchment.—*Engineering*.

The German battleship *Schlesien*, launched at the Schichau Yard, Danzig, in presence of the Kaiser on May 28, is the fourth of the *Deutschland* class to take the water. The others are the *Deutschland* herself and the *Hannover* and *Pommern*, which have been undergoing trials. The fifth of the series is in hand at the Germania Yard, Kiel. The new battleship has been built with great rapidity at Danzig, the definite orders to put her in hand having been received early this year. A good deal of work had, of course, been done beforehand and most of the material had been collected before that time. The Schichau firm only began its work in building battleships at the end of the last century, but from that yard have now been launched the *Kaiser Barbarossa*, *Wettin*, *Hessen*, *Lothringen*, and now the *Schlesien*. The new battleship is intended to be attached to the North Sea station, so that the five ships may make a division together.

We learn that the newest class of German battleships Ersatz *Sachsen* and Ersatz *Bayern*, 18,000 tons, will require a complement of 860, including twenty-eight officers. At the present time the largest German complement is that of the battleship *Braunschweig*, being 732. The new armored cruiser (about 15,000 tons) will have a complement of 791, while the cruisers of the *Roon* class have only twenty-three officers and 597 men.—*Army and Navy Gazette*.

TURBINES IN GERMAN NAVY.—The new third-class cruiser Ersatz *Wacht*, which is being built at the Vulcan Yard, Stettin, Germany, is to be fitted with turbine engines, which will be supplied by the German Turbine Parsons Co. They are to develop 13,600 I. H. P., as against 11,600 I. H. P. of the turbine-propelled Lübeck, and are estimated to give her a speed of 24 knots, as against 23 of the last-named ship. Her displacement will be 3,410 tons, against the Lübeck's 3,250; her length 354 feet 2 inches; her beam 42 feet 3 inches, and her draft 13 feet 9 inches; she is thus 12 feet longer and 3 inches more beam than the Lübeck.—*Nautical Gazette*.

It is understood that the Ersatz *Komet* will also have turbine engines.—EDITOR.

GREAT BRITAIN.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships.			
Dreadnought	18,000	Portsmouth.	Launched Feb. 10, 1906.
B	18,000	Portsmouth.	Authorized.
C	18,000	Devonport.	"
D	18,000	.....	"
Lord Nelson	16,500	Jarrow (Palmer).	" Sept. 4, 1906.
Agamemnon	16,500	Glasgow (Beardmore).	" June 23, 1906.
Africa	16,350	Chatham.	Under trial.
Britannia	16,350	Portsmouth.	Launched Dec. 10, 1904.
Hibernia	16,350	Devonport.	" June 17, 1905.
Armored Cruisers.			
Minotaur	14,600	Devonport.	" June 6, 1906.
Shannon	14,600	Chatham.	" Sept. 20, 1906.
Defence	14,600	Pembroke.	Building.
Warrior	13,500	Pembroke.	Launched Nov. 25, 1903.
Cochrane	13,500	Glasgow.	" May 20, 1906.
Natal	13,500	Barrow.	" Sept. 30, 1905.
Achilles	13,500	Newcastle.	Under trial.
Invincible	15,000	Newcastle.	Building.
Inflexible	15,000	Clydebank.	"
Indomitable	15,000	Glasgow.	"

MEMORANDUM EXPLANATORY OF THE PROGRAM OF NEW CONSTRUCTION FOR 1905-1906, WITH DETAILS NOT INCLUDED IN THE NAVY ESTIMATES FOR 1906-1907.—The Board of Admiralty, having approved of the leading principles to be embodied in the various types of vessels, appointed a committee of naval and scientific experts of large and varied experience as an advisory board to assist them in coming to a conclusion upon various important features in connection with these types.

In the instructions to the committee it was clearly stated that it was "no part of the function or purpose of the committee to relieve the Director of Naval Construction of his official responsibility for the design of the ships."

Having carefully examined and discussed various types of battleships and armored cruisers, and having had six alternative designs of each class under consideration, the committee unanimously decided to recommend the designs which, after the conclusions of the committee had been further discussed with the commanders-in-chief of the Channel and Atlantic Fleets, in January, 1905, and concurred in by them, were ultimately adopted.

The principal dimensions of the designs, together with those of the destroyers, are shown in the accompanying table in the form usually submitted to Parliament with the navy estimates.

The princpal features of the *Dreadnought* design, which has now been built to, are as follows:

Armament.—Ten 12-inch guns and twenty-seven 12-pounder Q. F. anti-torpedo-boat guns and five submerged topedo-tubes.

In arranging for a uniform armament of 12-inch guns, it became at once apparent that a limitation to the number of guns that could be usefully carried was imposed by considerations of the blast effect of the guns on the crews of those guns adjacent to them. It is obviously uneconomical to place the guns in such relative positions that the blast of any single gun on any permissible training should very seriously hamper the use of one or more of the remaining guns.

While it is recognized that broadside fire is held to be the most important in a battleship, all-round fire is also considered of great im-

portance, since it lies in the power of an enemy to force an opponent, who is anxious to engage, to fight an end-on action.

In the arrangement of armament adopted, six of the guns are mounted in pairs on the centre line of the ship; the remaining four guns are mounted in pairs on the broadside. Thus, eight 12-inch guns (80 per cent of the main armament) can be fired on either broadside, and four, or possibly six 12-inch guns (or 60 per cent of the main armament) can be fired simultaneously ahead or astern.

In view of the potentialities of modern torpedo craft, and considering especially the chances of torpedo attack towards the end of an action, it is considered necessary to separate the anti-torpedo-boat guns as widely as possible from one another, so that the whole of them shall not be disabled by one or two heavy shells. This consideration led the committee to recommend a numerous and widely distributed armament of 12-pounder Q.F. guns of a new design and greater power than those hitherto carried for use against torpedo craft.

In order to give the ship good sea-going qualities and to increase the command of the forward guns, a forecastle is provided, giving the ship a freeboard forward of 28 feet—a higher freeboard than has been given to any modern battleship.

The main armor belt has a maximum thickness of 11 inches, tapering to 6 inches at the forward and 4 inches at the after extremity of the vessel; the redoubt armor varies in thickness from 11 inches to 8 inches; the turrets and fore conning-tower are 11 inches thick, and the after conning-tower is 8 inches thick; the protective deck varies from 1¼ inches to 2¾ inches in thickness.

Special atention has been given to safeguarding the ship from destruction by underwater explosion. All the main transverse bulkheads below the main deck (which will be 9 feet above the water-line) are unpierced except for the purpose of leading pipes or wires conveying power. Lifts and other special arrangements are provided to give access to the various compartments.

Mobility of forces is a prime necessity in war. The greater the mobility the greater the chance of obtaining a strategic advantage. This mobility is represented by speed and fuel endurance. Superior speed also gives the power of choosing the range. To gain this advantage, the speed designed for the *Dreadnought* is 21 knots.

The question of the best type of propelling machinery to be fitted was also most thoroughly considered. While recognizing that the steam turbine system of propulsion has at present some disadvantages, yet it was determined to adopt it because of the saving in weight and reduction in number of working parts, and reduced liability to breakdown; its smooth working, ease of manipulation, saving in coal consumption at high powers, and hence boiler-room space, and saving in engine-room complement; and also because of the increased protection which is provided for with this system, due to the engines being lower in the ship—advantages which much more than counterbalance the disadvantages. There was no difficulty in arriving at a decision to adopt turbine propulsion from the point of view of sea-going speed only. The point that chiefly occupied the committee was the question of providing sufficient stopping and turning power for purposes of quick and easy maneuvering. Trials were carried out between the sister vessels *Eden* and *Waveney*, and the *Amethyst* and *Sapphire*, one of each class fitted with reciprocating and the other with turbine engines. Experiments were also carried out at the Admiralty Experimental Works at Haslar, and it was considered that all requirements promise to be fully met by the adoption of suitable turbine machinery, and that the maneuvering capabilities of the ship, when in company with a fleet or when working in narrow waters, will be satisfactory.

The necessary stopping and astern power will be obtained by astern turbines on each of the four shafts. These astern turbines will be arranged

in series, one high and one low pressure astern turbine on each side of the ship, and in this way the steam will be more economically used when going astern, and a proportionally greater astern power obtained than in the *Eden* and *Amethyst*.

The ship has a total coal bunker capacity of 2700 tons, and with this amount of coal she will be able to steam about 5800 sea miles at economical speed, and about 3500 sea miles at 18½ knots, after allowance has been made for bad weather and for a small amount of coal being left in the bunkers. Stowage for oil fuel has been arranged for, but oil fuel has not been taken into account in estimating the radius of action, which of course will be greatly increased thereby.

Considerable attention has been devoted to the arrangements for the accommodation of the officers and men. In view of the increasing length and greater power of modern ships, the usual position of the admiral's and captain's quarters right aft is becoming more and more open to objection. Up to the present the principal officers have been berthed at the farthest possible distance from the fore bridge and conning-tower, where their most important duties are performed. It has been decided that in this ship the admiral's and captain's quarters shall be placed on the main deck forward, near the conning-tower; also that the officers' quarters shall be placed forward, both on the main deck and on the upper deck, in the fore part of the ship. Ample accommodation for the remainder of the crew is available on the main and lower decks aft.

"INVINCIBLE" CLASS.—No corresponding description is given of the new cruisers of the *Invincible* class referred to in the opening paragraphs of the memorandum; but in the tables annexed to the memorandum the principal dimensions of these vessels are given, together with some other details, not including the thickness of the armor nor the nature of the armament, nor the I. H. P., with the corresponding speed to be attained. It is interesting to compare the *Dreadnought* with the *Invincible* in respect of such details as are given, and the following tables will facilitate this comparison:

Dreadnought.	Invincible.	Nature of details compared.
490	530	Length in feet.
82	78½	Beam in feet.
26½	26	Mean load draft in feet.
11,100	9,6600	Weight of hull, including armor and backing, in tons.
17,900	17,500	Displacement at load draft in tons.
900	1,000	Coal capacity at load draft in tons.
1,797,497	1,736,645	Total estimated cost of ship, including guns, in £.

Thus the *Invincible*, while 40 feet longer than the *Dreadnought*, has 3½ feet less beam, and her draft is only 6 inches less. Her weight of hull is 1440 tons less, though her total displacement is only 650 tons less. She carries 100 tons more coal at load draft, and, as her speed is doubtless considerably greater, involving increased weight of engines and boilers, though not necessarily in like proportion, in view of her greater length and presumably finer lines, it seems to follow that her armor and armament must be appreciably lighter than those of the battleship. But these details are not disclosed. The significant facts remain that the displacement of the cruiser is very little less than that of the battleship, and that her total cost, approximating to a million and three-quarters, is only some £60,000 less.

Similar details are given for the first time in the tables concerning the destroyers and submarines of last year's program; but these, with one exception, need not engage our attention here. The exception is the *Swift*, a destroyer of special type and of an entirely novel and very remarkable character. She is to have a length equal to that of the *Nile*

and *Trafalgar*, battleships which, though completed in 1890, are still in commission in reserve, a displacement more than double that of many of the still surviving torpedo-gunboats, and not much less than that of the *Pelorus* class of cruiser, an I. H. P. equal to that of the *Drake*, a speed faster than that of any vessel afloat, and she is to cost more than the ships of the very costly *Scout* class. The following table gives certain comparative details, which will, we think, be found very instructive. The *Cossack* is the largest of the new "ocean-going" destroyers, the *Adventure* is one of the "scouts," and the *Pelorus* and *Amethyst* are two third-class cruisers, which seem to afford some useful points of comparison, though, of course, all these vessels differ largely in type and function from the *Swift:*

Cossack.	Adventure.	Pelorus.	Amethyst.	Swift.	Nature of details compared.
270	374	300	360	345	Length in feet.
26	38¼	36½	40	34 1-6	Beam in feet.
7 5-6	13½	17	14½	10 5-12	Mean load draft in feet.
290	—	—	—	760	Weight of hull in tons.
795	2,940	2,135	3,000	1,800	Displacement at load drafts in tons.
14,000	15,850	7,000	14,200	30,000	I. H. P. on contractors' trial with forced draft.
33	25.42	20	23.42	36	Corresponding speed in knots in like conditions.
76	150	250	300	180	Coal (including oil) capacity in tons.
143,340	270,263	154,315	228,426	280,509	Total estimated cost including guns in £.

—*United Service Institution.*

THE NEW NAVAL PROGRAM.—The details of the government's naval program were outlined by Mr. E. Robertson, the Financial Secretary to the Admiralty, in the House of Commons in connection with the vote of £24,676,000 for ship building, repairs, &c. Dealing with "vote 8," aggregating nearly £14,000,000, it was stated that of this amount 9¼ millions sterling was for new construction. It was originally proposed in Lord Tweedmouth's estimates to begin building this year four classes of new ships—four of the *Dreadnought* type, five ocean-going destroyers, twelve coastal destroyers, and twelve submarines. With the sanction of the Board of Admiralty three of these items have been reduced as follows: Three *Dreadnoughts*, two ocean-going destroyers, and eight submarines, the number of coastal destroyers being the same. The total liability of the new program is thereby reduced to £6,800,000, a saving of £2,500,000. Mr. Robertson pointed out that the effect of this year's estimates will be a saving of £645,000, but much of this will not be surrendered to the Exchequer. The financial result will be chiefly felt next year, when the estimates will be lightened to the extent of £1,488,680. As a new feature of the program it was mentioned that early in the year a "mother ship" for the torpedo destroyers will probably be land down. Of the three *Dreadnoughts* one will be given out to private contract, and two will be built in the navy dockyards, the dockyards being Portsmouth and Devonport. The ocean-going and coastal destroyers will, as usual, be given to private firms. There has been a new departure in respect of submarines. They have hitherto been built by private contract, but this year a departure will be made by the Admiralty taking some of them over for the dockyards. These will be given to Chatham.

With regard to the estimates of 1907-8, provision is made for two armored vessels only as new shipbuilding, with the proviso that a further armored vessel be laid down if the forthcoming Hague Conference proves abortive in reducing armaments. This step has been taken by the govern-

ment to "emphasize to the Conference the good faith of the British Government and its desire to bring about a reduction of armaments."—*Engineer.*

No time is to be lost in commencing the new battleships of the *Dreadnought* type, and it is expected that the Portsmouth ship will be started about the end of September, if not earlier. The vessel is to be on exactly the same lines as the vessel now completing for sea. All the plans and specifications are at Portsmouth, so that no time will be required for the preparation of plans or for working out details. The new vessel is to be built on the same slip from which the *Dreadnought* was launched last February, and it will, therefore, not be necessary to extend the slip, although this work had been actually commenced and workshops pulled down to enable the extension to be made. An important feature in the construction of the second *Dreadnought* will be that the work will not be hurried, as in the case of the first vessel.—*United Service Gazette.*

MOTOR BOATS.—Intense interest has been aroused in the navy by the purchase of the Yarrow Napier boat. It is supposed to foreshadow the doom of steam and the gradual introduction of the explosion engine. The advantages of this are obvious: the disadvantages are not so clearly perceived by enthusiasts. At any rate, we cannot but fancy that those who predict the early extinction of the steam pinnace are somewhat premature. There is considerable analogy between launches and shore automobiles. The extraordiary way in which steam is now forcing itself as a serious rival to petrol for motor car propulsion suggests that the petrol launch is likely to find steam launch rivals once it has set the pace.—*Engineer.*

The *Dreadnought* is to be commissioned on September 1 for her preliminary gunnery and steam trials. The ship has now a very complete look. Changes have been effected in her rig, the main mast having been heightened considerably from the original design, and the wireless installation has been transferred thither. The main topmast is now nearly as high as the fore topmast.—*Engineer.*

The *Commonwealth,* with the Metcalfe coaling-at-sea apparatus, recently took in 780 tons at 43 tons an hour. This is attributed to the poor bag clips, as the *New Zealand,* trying the same experiment, got in an average of 78 tons an hour.—*Engineer.*

The *Majestic* has recently done some remarkable evolutions. She was an easy first at "out nets," and in "replace gear" did the evolution in 2 minutes 53 seconds. The next best ship, the *King Edward,* took 6 minutes 15 seconds.—*Engineer.*

LAUNCHINGS.—The new armored cruiser *Minotaur* was successfully launched at Devonport on June 5, the christening ceremony being performed by the Countess of Crewe. The vessel is one of three first-class armored cruisers for which provision was made in the navy estimates, 1904-5, her sister ships being the *Defence* and the *Shannon,* building at Pembroke and Chatham, respectively. The principal dimensions of the *Minotaur* are: Length, 490 feet; beam 74½ feet; mean draft, 26 feet; displacement, 14,600 tons. She will be engined by Harland and Wolff for an indicated horse-power of 27,000, which is estimated to give a maximum speed of 23 knots, and the boilers, 25 in number, will be of the Babcock and Wilcox water-tube type. The *Minotaur* has a belt of 6-inch Krupp steel armor amidships, tapering at the bow and stern, and her upper deck will be of three-quarter inch steel. Her armament will consist of four 9.2-inch Mark XI (caliber 50) guns, ten 7.5-inch (caliber 50) guns, and 30 small quick-firing guns. She will be fitted with three submerged torpedo tubes.—*United Service Gazette.*

A salient feature of the new battleship *Agamemnon*, launched on June 23 from the yard of Messrs. William Beardmore & Co., Ltd., Dalmuir, is her great gun power. She is a sister ship to the *Lord Nelson*, under construction at Jarrow-on-Tyne, and has a displacement of 16,500 tons, with 16,750 indicated horse-power. These two warships are the first that were designed by Sir Philip Watts, after his appointment as Director of Naval Construction. In many details, as well as in the broad principle of their design, the new vessels embody many departures from previous practice. They mark an intermediate place between the *King Edward VII* and *Dreadnought* classes. The former has four 12-inch and four 9.2-inch guns on the upper deck, and ten 6-inch guns, mostly on the main deck, the *Agamemnon* will have four 12-inch and ten 9.2-inch guns, all on the upper deck; while the *Dreadnought* will have ten 12-inch guns. The *King Edward VII* fires 5,920 lbs. of shot from 18 guns, the *Agamemnon* will fire 7,200 lbs. from 14 guns, and the *Dreadnought* 8,500 lbs. from 10 guns; at a comparatively long range also the guns of the *Dreadnought* will be much more effective than those of the other vessels. In the battleship just launched the 12-inch guns are mounted in pairs in barbettes fore and aft, while eight of the 9.2-inch guns are in twin barbettes, placed, two on each side of the vessel, and the remaining two 9.2-inch guns are in single barbettes, one on each side, in the center of the battery. The broadside fire of the ship will thus consist of four 12-inch and five 9.2-inch guns, while ahead or astern there will be two 12-inch and four 9.2-inch guns. There will also be thirteen 12-pounder p. fs., twenty 3-pounders, 2 maxims, and 5 submerged tubes for firing torpedoes. Her engines, of the usual naval type, are being constructed by Messrs. Hawthorn, Leslie & Co., Ltd., Newcastle-on-Tyne.—*Page's Weekly.*

The British battleship *Lord Nelson*, sister ship of the *Agamemnon* and second in size and armament to the *Dreadnought*, was successfully launched at Jarrow-on-Tyne on September 4.

The *Lord Nelson* is of 16,500 tons displacement and will have 16,750 indicated horse-power, giving her a speed of 18 knots. Her armament will consist of four 12-inch guns, ten 9.2-inch and 37 smaller guns. All her guns will be above the upper deck and her heavy guns will be more concentrated in the center of the vessel, while the smaller guns will be mounted on a central platform deck extending about one-third the length of the ship and more than thirty feet above the water-line. The new battleship has an armored belt twelve inches thick and has eight inches of armor on her sides above the belt. She will carry a crew of 755 officers and men.—*Nautical Gazette.*

COASTAL DESTROYERS.—Of the twelve new coastal torpedo-boat destroyers for the Royal Navy, the *Gadfly*, built by Messrs. John I. Thornycroft & Co., of Chiswick, has undergone her trials, the first of these vessels to do so. The other coastal destroyers of this type are the *Cricket, Dragon Fly, Firefly, Glowworm, Gnat, Grasshopper, Green Fly, Mayfly, Moth, Sandfly*, and *Spider*, and the two former have already been launched. The *Gadfly* has a displacement of 220 tons, and the contract speed was 26 knots. The preliminary contractors' trials on the measured mile at the Maplin had very satisfactory results, for, although the weather was unfavorable, wind and sea being very high, in the middle of the eight hours' official trial a speed of 26.05 knots was obtained, and this, in spite of the fact that the load on board the ship was greater than the ship will carry under ordinary conditions. The *Gadfly* is fitted with Parson's turbines and oil fuel apparatus, and considerable interest, therefore, attaches to her trials. One of tthe most important lessons of the maneuvers is connected with the use of oil fuel and the advantage possessed by vessels fitted to burn it. The *Gadfly* will be able to keep her speed and have a long range of action, seeing that oil fuel takes up a great

deal less room than coal, thus obviating the necessity for repeated trips into port to refill the ship's bunkers. It is worthy of remark that in the matter of turbines also the British Admiralty has led the way, especially as the Germans appear to have now proved the value of this system of propulsion in the t. b. d. S. 125.—*Army and Navy Gazette.*

WARSHIPS UNDER CONSTRUCTION.—According to *Lloyd's Register* shipbuilding returns, there are at present under construction for the British Navy in the United Kingdom forty-five warships, with a displacement of 246,595 tons. For the purposes of the return it has been assumed that a vessel may be regarded as "under construction" from the time when her keel is laid to the time when she is ready for her steam trials. Of course, when this latter stage is reached, the guns have usually still to be placed on board and the vessel to be fitted out before she is ready to be commissioned; but, to all intents and purposes, she is structurally complete. Of battleships under construction at the Royal dockyards there are four, one each at Chatham and Devonport, and two at Portsmouth; while in private yards there are two more, one at Dalmuir, and the other at Jarrow. There are nine first-class armored cruisers in course of construction, one at each of the Royal dockyards at Chatham and Devonport, and two at Pembroke dockyard, while at the private yards at Barrow, Clydebank, Elswick, and Govan the remainder are being built, one at each excepting Elswick, where two are in hand. There are no "protected" cruisers now building, nor are there any "scouts," but seventeen destroyers are under construction, all at private yards—six are being built at Cowes, five at Chiswick, two at Poplar, and one each at Birkenhead, Elswick, Hebburn, and Woolston. Thirteen submarine boats are also being built, all of them at Barrow. According to the same return, seven men-of-war are being built in the United Kingdom for foreign powers, all at private yards, and the displacement of these seven ships aggregates 23,020 tons. No battleships are being built, but at Barrow there are three cruisers under construction, and two destroyers are being built at Jarrow, as well as two more at Poplar.—*Army and Navy Gazette.*

Messrs. Thornycroft & Co., Chiswick; Messrs. Yarrow & Co., Poplar; and the Thames Ironworks, Blackwall, have been invited by the Admiralty to tender for the construction of the eight coastal destroyers which have been provided for in the new naval program. These vessels are to be of greater structural strength than the destroyers which are now being built, and with the full load on board are to do 26 knots per hour for eight hours. Tenderers have to submit their own designs, and the offers are due at the Admiralty by the end of next week.—*United Service Gazette.*

The battleship *Dreadnought*, the new largest man-of-war in the British Navy, will have many electrical features in light and power of the usual kind, and some special ones. At the top of her foremast, and immediately over the forward smokestack, is the fire-control platform, upon which will be placed the range-finders. It is probable that on this platform and in the turrets will be installed a new automatic system of range finding and gun elevating, by which the range will be electrically transmitted to each gun position, where by means of synchronized motors, the elevation of the guns will be steadily changed to correspond with the decreasing or increasing range as recorded by the range-finder on the platform. This method removes all possibility of error in the transmission of the ranges or the manual elevation of the guns, and leaves to the gun crew the duty of merely traversing the guns and keeping them fixed upon the enemy. Because of the lofty foretopmast the total height of the fore truck must be fully 200 feet above the water-line. A short mainmast is carried in the usual position, mainly to support the antennæ of the wireless telegraph.—*Electrical World.*

The *Dreadnought* will be the ninth vessel of that name belonging to the British Navy. The first was launched about 1572, and as late as 1620 formed part of the fleet; the second, launched in 1654, was first named *Marston Moor*. She foundered in 1690, the crew being saved, and the name was given to a vessel launched that year, which was discarded in 1707. The fourth *Dreadnought*, launched about 1710, was a hulk at Portsmouth 1742-48; the fifth was launched in 1742, and laid up in ordinary in 1778; the sixth launched in 1801, ended its days as a seaman's hospital ship (1831-56), as did the seventh, launched in 1808, and renamed in 1856. The eighth *Dreadnought*, launched in 1875, is a second-class battleship of 10,820 tons, 11.5 knots, which last did duty as tender and torpedo school to the *Defiance*.—*Nautical Gazette*.

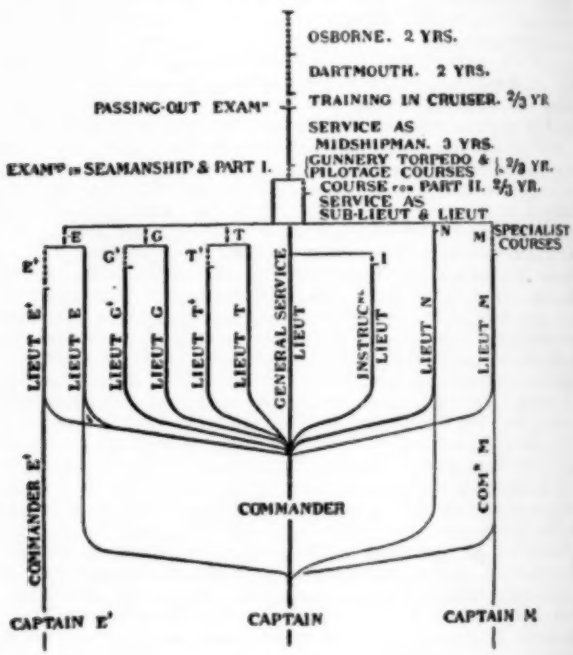
THE NEW SCHEME OF NAVAL TRAINING.—The new scheme of naval training exhibits a marked tendency to be a "scheme" no longer. It is rapidly, under the ægis of Professor Ewing, becoming a reality. Our readers will remember that the scheme outlined by Lord Selborne was launched in 1902, and very soon afterwards we had the pleasure of chronicling the opening of the new Naval College at Osborne, this event marking the commencement of the system under which all our naval officers will enter the navy, as it were, by the same door, and receive the same early training. Before this, as Professor Ewing reminds us in his recent lecture, the three classes of executives, engineers and marines, were entered under wholly different conditions, and at different ages. In fact their training was conducted on wholly separate lines. A full complement of 420 cadets is now under training at Osborne, while the number at Dartmouth, when the college there becomes fully occupied, will be little short of 400. The Director of Naval Education is able to assure us that everyone who has been concerned in the working out of its details is not only satisfied that the scheme has been conceived on sound lines, but is imbued with the conviction, which time only tends to strengthen, that it will be productive of immense benefit in promoting the unity and efficiency of the service. He adds that during the past year highly important steps have been taken by the Board of Admiralty in laying down the lines on which the development of the scheme may be expected to proceed after the early training of the young officers is complete, and, thanks to the labors of a committee presided over by Admiral Sir Archibald Douglas, and to those of certain sub-committees associated with it, it is now possible to view the scheme as a connected whole.

On promotion to the rank of lieutenant, selection is to be made for specialist training, and it is estimated that about two-thirds of the officers will at this stage take up one or other of the various specialist branches, the other third remaining general service lieutenants. The specialist branches are: Engineering, gunnery, torpedo, navigation, and the marine or military branch; lieutenants qualifying as specialists in these branches being distinguished, respectively, by the letters (E), (G), (T), (N), or (M). The accompanying chart shows in the upper column the various stages of the early training, and subsequently the separation into the various specialist lines. It also shows the bifurcation which takes place in certain specialties between the ordinary specialist and the officer who takes a more extended scientific course of training. It also shows, by the subsequent convergence of the various lines, the extent to which service in one or another specialist capacity is now intended for the most part to be only temporary.

The dotted lines indicate educational courses. Thick and thin lines show the relative number specializing and continuing in a special line or reverting to general executive duties.

Adverting to the career of an engineering lieutenant, Professor Ewing says: "It is intended that the officers selected to qualify for engineering duty shall go for a year to Keyham, for a course of training which, in

addition to such theoretical work as may be required to supplement the Dartmouth training, will give them the opportunity of becoming acquainted in the dockyard with larger work in the way of erection and repairs. At the end of this course a limited number will proceed with the advanced course qualifying for lieutenant (E†), which will last for two years more, and will include much the same matter as the present advanced engineers' course at Greenwich. Officers taking this course will become practiced in engine design, and will study the most scientific developments of their subjects. The lieutenants (E) will then be appointed to ships as junior engineer officers. It is intended that each large ship shall carry three engineering specialists, as chief, senior, and junior engineer, respectively—two years' service as a junior engineer being necessary to qualify an officer for the position of senior engineer, and at least two years more to



qualify a senior engineer for the post of chief engineer of a small ship. Though the lieutenant (E) will be employed almost continuously in engineering duty, he will have such opportunity of performing deck work and of keeping watch on the bridge as will allow him to maintain efficiency as an executive officer, and by far the greater number of lieutenants (E) will revert to the general executive list on promotion to commander, just as the lieutenant (G), (T), or (N) now does. It will be different, however, with lieutenants (E†). As a rule, they will not revert, although the door is left open for reversion in exceptional cases. It is intended that they shall proceed to sea as junior engineers, in order to obtain further engine-room experience, and then, after a year or so, become available for special posts at the Admiralty or dockyards requiring a high degree of scientific knowledge and professional skill. They will return to sea from time to time, to keep in touch with the engine-room side of modern

practice, but they will continue to be employed as engineering specialists, whether afloat or ashore. Except in the special instances already alluded to, they will therefore not be eligible for the command of ships or fleets, but will rise through the various ranks, retaining their distinctive letter as commanders (E†), captains (E†), and so on, and will be eligible to fill important technical positions to which their scientific knowledge and practical experience give them a special claim."—*Page's Weekly.*

BRITISH NAVAL MANEUVERS, 1906.—The following statement with regard to the naval maneuvers has been forwarded to us by the Admiralty:

The naval maneuvers this year will be divided into two distinct periods separated by a week, which interval will be devoted by the admirals to tactical exercises of their respective commands.

The war vessels to be employed will include the Channel, Mediterranean, and Atlantic Fleets, with their attached cruisers and torpedo craft, the First, Second, Third, and Fourth Cruiser Squadrons, with all torpedo craft in home waters both in full commission and in commission in reserve, and the vesels of the Reserve Divisions at the several home ports. The only vessels in home waters which will not take part in the first period of the maneuvers will be those undergoing extensive repairs and refits.

Advantage will be taken during the first period of the maneuvers to test the arrangements for mobilization of the fleet under war conditions.

The co-operation of the mercantile marine has been invited during the second period of the maneuvers.

The general idea of the second period of the maneuvers is based upon the assumption, for maneuver purposes, that war has broken out between a stronger naval power—red—and a weaker but still formidable naval power—blue.

Although under such circumstances the primary object of the red commander-in-chief would be to seek out and defeat the blue fleet wherever it appeared, it is not to be expected that the blue commander-in-chief would risk a general engagement with the red fleet unless he could bring to action a portion at a time, and under conditions favorable to himself.

Among the steps that he would be likely to take to cause a dispersion of the red fleet, with a view to obtaining such an opportunity, the most likely to succeed would be an attack on the red trade.

In adopting this course he would count not only on the actual loss he would be able to inflict on his enemy, but also, if the red nation was one largely dependent on its commerce, he would be able to reckon on creating a national panic which might compel the red commander-in-chief to disperse his forces to an extent that neither the actual risk to commerce nor sound strategy would justify.

The investigation of the actual risks to which the trade is likely to be exposed under these conditions, and of the best means of affording it protection, without sacrificing the main object of taking every opportunity of bringing the enemy's fleet to action, is evidently of great importance not only to those who have to conduct the operations, but also the mercantile community.

An under-estimate of the risk to the trade and a too great concentration of the red forces might give the enemy the change of inflicting great and avoidable loss on the merchant shipping, while on the other hand an over-estimate of the risk might lead to a great rise in the rate of insurance, and almost complete stoppage of trade, which would be more injurious to the country than any losses likely to be inflicted directly by the enemy.

In either case a demand would probably arise on the part of the red community for an injudicious dispersion of the red forces on expeditions for the direct protection of trade, which would render them liable to be defeated in detail, and greatly reduce the chance of bringing the enemy's main fleet to action.

Such in outline are the problems to be elucidated—so far as practicable—during the forthcoming maneuvers.

Red territory will consist of England, with defended ports at Milford, Falmouth, Portland, Plymouth, Portsmouth, Sheerness, Swansea, Cardiff, and Barry.

Blue territory will consist of Scotland, Ireland, and the Channel Islands, with defended ports at the Firth of Forth, Queenstown, Berehaven and Alderney.—*Engineer.*

For the purposes of the maneuvers the British Fleets have been divided as follows:

Red (British).	Blue (Enemy).
Under Admiral Sir A. K. Wilson.	Under Vice-Admiral Sir W. H. May.
Channel Fleet.	Atlantic Fleet.
Mediterranean Fleet.	Second Cruiser Squadron.
First Cruiser Squadron.	Some Reserve Ships.
Third Cruiser Squadron.	Large Number of Torpedo Craft.
Some Reserve Ships.	
About Fifty Destroyers.	
Twenty Submarines.	

On the red side the number of battleships engaged is 21, as against nine on the blue side, while the number of armored and unarmored cruisers is 41, compared with 18. On the red side there are also two cruisers (*Sapphire* and *Barham*), eight scouts, and eight gunboats, as against five gunboats on the blue side. Of torpedo-boats there will be 63 on the red side, and none on the blue side. On the red side the number of submarines engaged is 23, while none are engaged on the blue side. The grand total of destroyers on the red side is 67, as against 57 on the blue side. The first few days of the maneuvers are apparently for the purpose of testing the arrangements for guarding against a sudden attack on the home ports. The organization of the Royal dockyards will, incidentally, be tested for dealing with warships that would have to put in suddenly during war time owing to breakdowns or injuries sustained in action.—*Page's Weekly.*

TRADE AND THE NAVAL MANEUVERS.—The naval maneuvers being now over, it is comparatively easy to read at least one main lesson they enforce. Briefly reviewed, they were split into three stages, of which only the last was made public property. Stage one imagined "the eve of war," but was probably designed to exercise shore defences rather than to teach any particular lessons as to strategy. The principal incidents were attacks upon bases, and of these that on Portsmouth appears to have been unpleasantly successful. Cruisers and destroyers attacked this harbor, and their boats in some way succeeded in penetrating the defences unseen, and in blowing up the boom and the dock entrances without opposition from the defenders. Some satisfaction is sought in the plea that it "probably could not have been done in real war," but the suggestion is inevitable that the defence of our first naval base is not ideal. The rest of the operations were too involved to follow—that is with the details available for publication. The second stage was devoted to tactical exercises which need no reference here; the third touched the vital question of our trade in war time.

The situation was approximately as follows: England was "British;" the hostile (blue) side was given Scotland, Ireland, and Lagos, with bases at Berehaven, Alderney, Queenstown, and Lagos. A parallelogram of ocean extending from Scilly to Gibraltar was marked out as the British trade area, upon which sailed a number of slow merchant ships that had agreed to participate, and a variety of destroyers and gunboats which had been directed to simulate merchant craft. On these the blue ships were

directed to operate under the command of Admiral Sir William May, while defence was entrusted to Admiral Sir Arthur Wilson, with a force approximately three times that of the attackers. With the proportion given to Admiral Wilson we have no quarrel; it represents approximately the majority we should have against most enemies, pending that further reduction of the navy so dear to some modern economists. Neither do we object to the very restricted trade area, because the task imposed upon the red fleet was consequently far less onerous than would be actually forced upon the British Fleet in war. As originally contemplated, we believe the area was to have been much larger; but at a time when a large body in the House of Commons desires to cut down naval expenditure, possibly it was deemed wise to run as few risks as might be of showing our naval strength to be inadequate.

Starting from Berehaven with his entire fleet, and using his battleships as cruisers to the extent of fitting dummy funnels to the *King Edwards* in the hopes that they might be taken for vessels of the *County* class, Admiral May swept south towards Lagos in three lines, 130 miles apart, and 30 miles between ship and ship. In doing this he seems to have failed to strike the trade route, and some of his vessels met no merchantmen at all for days. Meanwhile Admiral Wilson went south in pursuit, and after a series of small encounters, drove Admiral May's battleships, less the three slowest, away to the north. Lord Charles Beresford at the same time hunted for the principal blue cruisers, which under Admiral Prince Louis of Battenberg, sought trade off Cape St. Vincent. It is stated by correspondents with the squadron that Prince Louis received contradictory orders, and once at least was taken from his cruising ground for purposes having nothing to do with commerce war. Thus delayed he coaled at Lagos half-a-day late. He was further hampered by certain of his cruisers breaking down, and was finally decoyed into a trap from which only three of his cruisers, one of them disabled, escaped. Admiral May, scattered, one of his best battleships broken down with boiler troubles, was driven from the trade route, and when operations ended was "ravaging" the British coast outside the exact trade area, but inside the field of the maneuvers.

Told thus briefly, the story is not a very glorious record for the hostile fleet. It can hardly be described as a "best possible," even against the heavy odds that existed. One thing, however, has been somewhat ignored by two sections of critics; by those who hold the Mahan doctrine that commerce attack can do no serious harm, and by those who advocate naval reductions. Neither section, so far as we can gather, has paid any attention to the cardinal fact that Admiral May accounted for at least 30 per cent of the "commerce" involved—an artificially small commerce, be it noted. The plea that his Scarborough depredations were "outside the game" is a purely technical objection. In actual war the fact that Admiral Wilson had driven most of his ships—by no means all—from one small section of the seas would in no way have prevented the destruction of Hull, Tyneside, and a score of other places. We have no desire to pose as alarmists. It is not our mission. But facts are facts, and no unprejudiced observer can ignore the obvious lessons that under modern conditions an inferior fleet can do immense mischief, theories to the contrary notwithstanding. Of the genius of Admiral Wilson there can be no question, yet with the best will in the world he failed to destroy more than one-third of the enemy, or to protect more than 70 per cent of commerce in a very restricted area. Even though luck was with him he failed. That he had luck on his side is beyond question; it was circumstances other than war which deprived Admiral May of such important fighting units as the *New Zealand* and the *Black Prince*. Admiral Wilson, it is true, did not get full value out of most of the *Canopus* class, nearly every ship of which had more or less defective condensers. Still he was able to use these vessels, and they told in the result. Admiral May lost

each of the vessels mentioned above at critical moments, when their presence would have been invaluable. Yet, hampered as he was, his operations, had they been really hostile, would have created no small panic throughout the country. That, in face of such a lesson, in face of the scarcely veiled intention of one foreign power to dispute with us the mastery of the seas, there should be a considerable section of politicians bent upon naval reductions appears incredible. The maneuvers, whatever they were designed to show, have proved with unexpected emphasis that our fleet is not strong enough to protect trade under the peculiar conditions of modern war.—*Engineer.*

ITALY.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships.			
Roma	12,625	Gov't Yard, Spezia.	Building.
Napoli	12,625	" " Naples.	Launched Sept. 10, 1906.
Vittorio Emanuele	12,625	" " Castellamare.	" October 1, 1906.
Regina Elena	12,625	" " Spezia.	" June 19, 1906.
Armored Cruisers.			
San Giorgio	10,000	Gov't Yard, Castellamare.	Building.
San Marco	10,000	" "	"
Pisa	10,000	.....	Projected.
Amalfi	10,000	.....	"

The published naval estimates of Italy for 1906-7 amount to a very considerable increase on the preceding year. Of this increase, about one-half is devoted to improving the conditions of service for petty officers and sailors. In the principal squadron in home waters there will be four battleships and four armored cruisers, with a flotilla of destroyers and torpedo-boats. There will also be a reserve squadron, with five battleships, and several torpedo craft. One new first-class battleship of 12,600 tons is under construction, and two armored cruisers of 9,800 tons. Another smaller armored cruiser of 6000 tons is also building. Four destroyers each of 390 tons, and four submarines, are also making progress. A special feature of the Italian building program is to be found in the 18 sea-going torpedo-boats, each of 250 tons and 25 knots, now building. The vessels mentioned above have yet to be launched, but three battleships each of 12,600 tons, are being completed afloat. Of these, the *Regina-Elena* should commence her trials early in 1907, and the *Vittorio-Emanuele* later in the same year.—*United Service Gazette.*

JAPAN.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships.			
Satsuma	19,000	Yokosuka.	Building.
Aki	19,000	Kure.	"
Armored Cruisers.			
Ikoma	13,000	Kure.	Launched April 9, 1906.
Tsukuba	13,000	"	" Dec. 26, 1905.
Ibuki	13,000	Yokosuka.	Building.
Kurama	13,000	"	"
Scouts.			
Tone	2,500	Sasebo	Building.
Yodo	2,500	"	"
Mogami	2,500	Nagasaki.	"

ADDITIONS TO THE JAPANESE NAVY.—Tokyo newspapers, says the *Overland China Mail*, contain some interesting particulars about the Naval Department's program for maintaining the strength of the navy. The ships added to the fleet during the immediate past, or on the verge of being added, are:

Battleships, the *Aki*, the *Satsuma;* armored cruisers, the *Kurama*, the *Ibuki*, the *Tsukuba*, the *Ikoma;* protected cruisers, the *Mogami*, the *Tone*, the *Yodo;* third-class gunboat, the *Fushimi*, and thirty destroyers.

Among the above the *Aki* and the *Ibuki* are not yet launched, but they will take the water before the end of this year or early next year.

The ten ships and thirty destroyers aggregate 150,000 tons, and when added to the present strength will bring the total displacement to 520,000 tons. But this last statement requires a great deal of modification, for there are included in the navy not a few ships which must be considered obsolete and only fit for non-combatant duties. These are the eight cruisers *Nani-wa, Takachiho, Hashidate, Itsukushima, Matsushima, Chiyoda, Izumi*, and *Akitsushima;* the seven coast-defence vessels, *Kongo, Hiyei, Tenryu, Yamato, Katsurage, Musashi, Takao, Chinyen*, and *Fuso;* the four gunboats, *Iwaki, Maya, Chokai*, and *Akagi;* and the two dispatch-boats, *Yayeyama* and *Tatsuta*. These twenty-two ships are practically useless for combatant purposes. It will be observed that the *Katori* and the *Kashima* are not mentioned in the above list of new vessels. If the *Mikasa* is not restored to her old place in the fighting line—and the very long time occupied in raising her suggests that contingency—Japan will have only three of the six battleships with which she entered the war, and if to these we add the *Katori*, the *Kashima*, the *Aki*, and the *Satsuma*, her force in battleships will be seven next year, exclusive of the ships taken from Russia.—*United Service Gazette.*

A despatch from Sasebo announces that the *Mikasa* has been raised, after several failures.

The *Yacht* states that the armored cruiser *Kurama* is ready for launching, and that her main battery is to consist of four 12-inch, four 8-inch and six 4.7-inch guns. The *Engineer* gives the battery as four 12-inch, eight 8-inch, and twelve 4.7-inch guns.

The *Moniteur de la Flotte* gives the following as the Japanese Navy list on March 1, 1906: Seven admirals, 23 vice-admirals, 26 rear-admirals, 99 captains, 146 commanders, 192 lieutenant-commanders, 342 lieutenants, 320 ensigns, first class, and 268 ensigns, second class; or 1423 officers in all. The average ages are: admirals, 56 years 6 months; vice-admirals, 52 years 10 months; rear-admirals, 50 years; captains, 44 years 3 months.

RUSSIA.

VESSELS BUILDING.

Name.	Displacement.	Where Building.	Remarks.
Battleships.			
Emperor Paul I.....	16,000	St. Petersburg (Baltic Yard).	Building.
Andrei Pervosvannui.....	16,000	St. Petersburg (Galerney Island).	Launched May, 1905.
Evstafi.....	12,500	Nicolaiev.	Building.
Ivan Zlatoust.....	12,500	Sevastopol.	Launched May 13, 1906.
Armored Cruisers.			
Admiral Makaroff.....	7,200	La Seyne.	Launched May 8, 1906.
Bayan.....	7,200	St. Petersburg	Building.
Pallada.....	7,200	"	"
Rurik.....	15,000	Vickers	"
Protected Cruisers.			
Kagul.....	6,750	Nicolaiev.	Building.

The *Yacht* gives the following as the dates of completion of the Russian warships now building:

Ivan Zlatoust, spring of 1907; *Evstafi*, spring of 1907; *Emperor Paul I*, spring of 1908; *Andrei Pervosvannui*, spring of 1908; *Rurik*, autumn of 1907; *Admiral Makaroff*, end of 1907; *Pallada*, spring of 1908; *Bayan*, spring of 1908; *Kagul*, spring of 1908.

The *Marine Rundschau* gives the following as the characteristics of the projected Russian battleships:

Displacement, 19,800 tons; battery, four 12-inch guns; twelve 10-inch guns; twenty 4-7-inch guns. Speed, 18 knots. Normal coal supply, 1200 tons.

GASOLENE MOTORS FOR RUSSIAN NAVY.—The largest marine gasolene engine ever built is in Baltimore awaiting shipment to Russia for a submarine boat. This internal combustion motor, or rather series of motors, develops 1600 horsepower. Three others are to be built of similar model for the Russian Government. These engines are to go in Lake submarines, and are being built by Messrs. White and Middleton. The present order for the Russian Government aggregates $100,000 in value.

The boats in which these engines are to go are to be twin screws of 120 feet in length and to develop 22 knots on the surface and to store electricity at the same time for submersion use. They are to be built in Europe.

To each of the twin shafts of the submarines are to be attached an eight-cylinder engine, a four-cylinder engine and an electric engine. The cylinders are 12 inches in diameter and have 4-inch stroke.—*Baltimore American.*

UNITED STATES.

VESSELS BUILDING.

No.	Name.	Speed. Knots.	Where Building.	Per cent completed Sept. 1, 1908.
	Battleships.			
14	Nebraska	19	Moran Bros. Co.	90.4
15	Georgia	19	Bath Iron Works.	99.6
18	Connecticut	18	Navy Yard, New York.	99.1
20	Vermont	18	Fore River Shipbl'g Co.	92.7
21	Kansas	18	New York S. B. Co.	87.
22	Minnesota	18	Newport News.	95.
23	Mississippi	17	Wm. Cramp & Sons.	62.2
24	Idaho	17	Wm. Cramp & Sons.	60.3
25	New Hampshire	18	New York Shipbl'g Co.	51.8
26	South Carolina	18	Wm. Cramp & Sons.	0.
27	Michigan	19	New York Shipbl'g Co.	0.
	Armored Cruisers.			
6	California	22	Union Iron Works.	95.
9	South Dakota	22	Union Iron Works.	93.
10	Tennessee	22	Wm. Cramp & Sons.	100
11	Washington	22	New York Shipbl'g Co.	100
12	North Carolina	22	Newport News.	57.2
13	Montana	22	Newport News.	51.
	Protected Cruisers.			
20	St. Louis	22	Neafie & Levy Co.	100
21	Milwaukee	22	Union Iron Works.	98.5
	Scout Cruisers.			
	Chester		Bath Iron Works	45.
	Birmingham		Fore River Shipbl'g Co.	44.9
	Salem		Fore River Shipb'g Co.	45.

THE BATTLESHIP "NEBRASKA."—The largest class of battleships of the United States Navy is the *Georgia* class, which comprises five ships—the *Georiga, Nebraska, New Jersey, Rhode Island,* and *Virginia;* and of these the last to be completed will be the *Nebraska.* Especial interest attaches to this ship because of the fact that she was built in the young State of Washington and at the thriving city of Seattle, which, a quarter of a century age, was not much more than a village in size. The construction of a modern battleship calls for the highest skill and a thoroughly complete and costly shipbuilding plant, and that this great vessel, with a displacement of about fifteen thousand tons, should have been built and engined in an industrial center so modern is certainly a striking evidence of the material development of this flourishing maritime city of the extreme Northwest.

The *Nebraska* and her sisters are distinguished among battleships by the extraordinary concentration of fire of the guns of the main battery of which they are capable, being in this respect, at least in the number, if not in the weight of shell which they can deliver in any direction, unsurpassed either in our own or any other navy. This concentration is obtained by the method of mounting the 8-inch guns, of which four are carried at the great elevation of 32 feet upon the roofs of the turrets containing the 12-inch guns. The other four 8-inch are mounted amidships, 26 feet above the water, in two turrets, one on either broadside. This disposition enables the *Nebraska* to concentrate two 12-inch and six 8-inch guns directly ahead or astern, while on either broadside she can deliver the fire of four 12-inch and six 8-inch guns. In the secondary battery she carries in broadside on the gun deck twelve 6-inch rapid-fire guns, and for repelling torpedo attack she mounts twelve 3-inch, twelve 3-pounders, and eight 1-pounders. She also carries two 3-inch field guns and eight small-caliber automatic guns. Her torpedo armament is also an exceedingly powerful one, consisting of four of the new 21-inch torpedoes driven by turbine engines, which are capable of a speed of 36 knots at a range of 1200 yards, and a speed of 28 knots at a range of 3500 yards.

The distribution of armor on the *Nebraska* is as follows: She carries a water-line belt which is continuous from stem to stern and varies in thickness from 11 inches amidships to 4 inches at the ends. With this is associated a deck three inches in thickness. The main barbettes and turrets carry ten inches of armor and the secondary turrets six inches. The broadside battery is protected by side armor six inches in thickness which extends between the main barbettes from the top of the main armor belt to the upper deck. There are 9 inches of armor on the conning-tower, and the 14-pounder guns also are protected by two inches of armor. The total weight of armor is 3690 tons.

The ship is driven by twin reciprocating engines, which are designed to give a speed of 19 knots with 19,000 horsepower. The maximum coal supply is 1700 tons.

The ship has a water-line length of 435 feet; her beam is 76 feet 2½ inches, and her maximum draft 26 feet. Her complement of officers and men will consist of 41 officers, 675 enlisted men, and 60 marines. On her builders' trial, carried out on July 2 of this year, she made a speed of 18.95 knots.—*Scientific American.*

THE BATTLESHIPS "SOUTH CAROLINA" AND "MICHIGAN."—The recent letting of contracts for the construction of the two new battleships *South Carolina* and *Michigan* to the Cramp Ship and Engine Building Company and to the New York Shipbuilding Company, has brought these two formidable vessels into special prominence, and a description of the leading features of their design will be timely.

Particular interest attaches to these vessels because of the fact that they are the first battleships to be designed by our Navy Department subsequently to the conclusion of the Russo-Japanese War, and that in their

design they embody the valuable experience gathered during that great conflict. The most marked feature is the complete elimination of the intermediate battery, which in our earlier ships consisted of a large number of 5-inch, 6-inch, 7-inch, or 8-inch guns. The customary number of guns in the main battery has been doubled, so that instead of four 12-inch carried in two turrets, the new ships have eight such guns mounted in four turrets. The numerous battery of small rapid-fire guns is retained since its service will always be necessary for the repelling of torpedo-boat attack. In length and displacement the new vessels are approximately the same as their predecessors, the *Louisiana* and *Connecticut*, though with greater beam and ½ knot more speed. They are also more effectively armored than those ships, and in fighting power they are believed to be vastly superior; that is to say, if the new theories as to the probable tactics of future naval conflicts prove to be correct.

The general dimensions of the vessels are as follows: The length on the load water-line will be 450 feet; the breadth is greatly increased over that of the *Connecticut*, being 80 feet 2⅝ inches. The mean draft at trial displacement must not exceed 24 feet 6 inches, on which draft the displacement must be 16,000 tons.

The General Appearance of the New Battleships.—The two ships when completed will, in appearance, be distinctly different from any of our other battleships. The most noticeable feature, of course, will be the four 12-inch turrets and their guns, mounted in pairs on the axial line of the ship, two forward and two aft of the superstructure. The doubling up in the number of 12-inch turrets, and the placing of them one ahead of the other, has necessarily shortened the length of the superstructure, and crowded the masts, smokestacks, etc., into a shorter space amidships, a fact which is readily noticeable on looking at the engraving of the new ships. In order to save weight the freeboard of the ship has been reduced by the depth of one deck, or about 8 feet, from aft of the superstructure to the stern. Hence the *South Carolina* and *Michigan*, while they will have the same freeboard forward as the *Connecticut* and *Louisiana*, will have a lower freeboard by about 8 feet throughout the after third of the vessel's length. The most forward pair of 12-inch guns is carried at about the same height as the 12-inch guns of the *Connecticut*, or say about 24 feet above the water-line. Immediately abaft of these is the second pair of forward 12-inch guns, which are so mounted as to fire clear across the roof of the forward turret, the barbette for these guns being increased in height by about 8 feet in order to give the requisite elevation. The guns have the great command of 32 feet above the water-line. The after pair of turrets with their four guns are mounted similarly, although at an elevation in each case 8 feet lower than that of the forward guns.

The shortening of the superstructure has been accompanied also by a moving of the two military masts toward the center of the vessel, and a distinct novelty is seen in the placing of these masts, not on the longitudinal axis of the ship, but diagonally, the forward mast being moved over to starboard and the mainmast to port. Advantage is taken of this new position to mount the boat cranes on these masts, with, of course, a considerable saving of weight.

Armor and Armor Protection.—The armor protection has been exceedingly well worked out, and forms one of the most commendable characteristics of these vessels. Its most important element is a water-line belt 8 feet in width, and more than 300 feet in length. The midship portion of the belt varies in thickness from 11 inches at the top to 9 inches at the bottom, while that in the wake of the magazine is 12 inches thick at the top and 10 inches at the bottom. The casemate side armor above this water-line belt is nearly 300 feet long; it will be 8 inches thick at the top, 10 inches at the bottom, and will be about 8 feet 1 inch wide amidships. This is a casemate protection which, in extent and in thickness, has never been approached in our previous battleships. Triangular athwart-

ship armor, 10 inches thick, will be fitted at the after end of the belt armor, between the slope of the protective deck and the extension of the flat protective deck. Also an athwartship armor bulkhead, extending entirely across the ship between the upper platform and the protective deck, will be fitted at the forward end of belt. This will be 10 inches thick throughout. Furthermore, an athwartship casemate armor bulkhead will be fitted between the shell plating and the barbettes between the berth and main decks at forward and after ends of casemates; this will be 8 inches in thickness throughout.

Barbette Armor.—The forward barbette extends from the protective deck to about 4 feet above the upper deck, and it varies in thickness from 10 inches to 8 inches, according as it is flanked by the side armor of the ship. The after forward barbette extends to a height of about 12 feet above the upper deck, and carries the same general thickness of armor. The forward after barbette extends from the protective deck to 12 feet above the main deck, and the barbette aft of this extends from the protective deck to 4 feet above the main deck. In the case of each of the four turrets, the port plate will be 12 inches in thickness, the rear and side plates 8 inches, and the top plates 2½ inches in thickness.

The vessels will be propelled by vertical twin-screw four-cylinder triple-expansion engines of 16,000 horsepower. The steam pressure will be 265 pounds in the high-pressure valve chest, and the revolutions per minute will be 125. Steam will be supplied by twelve water-tube boilers fitted with superheaters, carried in three water-tight compartments. The vessels will be lighted throughout by electricity, and the operation of the turrets, ammunition hoists, and, indeed, most of the mechanical work throughout the ship will be performed by electrical power. The coal bunkers will be arranged with a direct reference to the rapid and efficient supply of coal to the fire rooms, and with especial reference to efficient water-tight subdivision of the vessel. There will be provided for coaling these ships not less than five winches, ten booms, wire spans, with the necessary whips at all the usual chutes and other openings, special provision having been made for the rapid coaling of the vessels. There will be a bridge both forward and aft, built according to the latest practice. The masts will be fitted with searchlight platforms, and arranged for wireless telegraphy. There will be one signal yard on each mast, a battle gaff on the mainmast, and a lookout platform on the foremast.

Distribution of Weights.—It is instructive to study the distribution of weights in these new vessels; the guns, mounts, ammunition, and ordnance stores will represent about 7 per cent of the trial displacement; the motive power, including engines, boilers, piping, etc., about 10 per cent, and the total armor protection reaches the great figure of more than 25 per cent of the trial displacement.

Concentration of Fire.—It will be seen at once that by arranging the two extra pairs of 12-inch guns at a sufficient height to enable them to be fired across the roofs of the adjoining turrets, the theoretical all-round concentration of fire is remarkably powerful. Forward, when in pursuit of the enemy, or when fighting in the end-on position, it will be possible to concentrate four 12-inch guns, which is double the number that can be trained in a similar direction on the *Connecticut* and *Louisiana*. Aft there is a similar concentration of four 12-inch guns, while on the beam these ships will be able to train eight 12-inch guns.

In a previous issue of the *Scientific American* we have criticized this method of placing the armament, on the ground that previous experience with the Oregon and her class showed that if heavy guns were fired across the roofs of the adjoining turrets, the work of the gun crews in these turrets would be seriously interfered with. We are informed, however, that particular attention has been given by the Navy Department to this difficulty, and that by virtue of the improved sighting ports and the closely-fitting port shields employed, and other arrangements, it will

be possible, in an emergency, to fire any of these 12-inch guns in any position of training without serious interference with the work of the other gun crews. If this should prove to be the case, our Navy Department will be the subject for congratulation on having produced, in proportion to their displacement, by far the most powerful fighting ships built in the world to-day; for it must be remembered that these vessels are of but 16,000 tons displacement, while the latest battleship designs of other governments are of from 18,000 to 19,000 tons displacement.

There are many novel details of construction in these vessels, which, for obvious reasons, it is not expedient to make public at the present time—such, for instance, as the more complete water-tight subdivision of the vessel, and provision against heeling due to damage in action; and the protection of the vessels' longitudinal strength when damaged by gun fire, the provision of adequate longitudinal strength being particularly important in view of the concentration of the weight of the barbettes and heavy guns so near the extremities of the ship.—*Scientific American.*

ORDNANCE AND GUNNERY, TORPEDOES.

NEW REGULATIONS FOR GUNNERY TRAINING IN THE FRENCH NAVY.—On account of the proved necessity for long-range fire, the Department of Marine has been occupied lately in improving the optical apparatus for sighting guns at long ranges; the delicate adjustment and fitting of telescopic sights could only be undertaken when the different ships happened to be in the dockyards. Hence there has been some delay, but most of the large vessels are now provided with sights for firing up to ranges of 9000 yards, though the men are not yet thoroughly trained in their use.

Up to recently ships have been supplied for their quarterly firing with a special practice ammunition with a reduced charge, and it has only been once a year that full charges have been fired. A recent circular, however, has abolished in principle practice ammunition, and from 1907, when all this class of ammunition will have been expended, only full battle charges will be used at target practice.

This reform will undoubtedly be of great benefit to the guns' crews in accustoming them to firing the battle charges, and by keeping up a regular expenditure it assures that the powder will not have deteriorated from having been kept too long in stock. There is also the further advantage that on mobilizing, ships will not be delayed by having to exchange practice for battle ammunition as formerly.

Training in gunnery has up to now been carried out on board the *Couronne* gunnery-ship, but this old vessel no longer fulfills modern requirements, and it has been thought advisable to institute an additional gunnery course at sea. The armored cruiser *Pothuau* has been selected as suitable for the purpose, and to her officers and men will be passed on from the *Couronne.—United Service Institution.*

BRITISH GUNLAYERS' TESTS, 1906.—We have scarcely dealt to the extent which the subject demands with the marvelous shooting which has resulted from the gunlayers' test of 1906. In this matter we have felt that perhaps it might have been more expedient to wait until the official results had been published. But there are, indeed, new records created which appear to deserve immediate attention. We have in the *King Edward VII* 8.7 hits per minute, with the 6-inch gun. In the *New Zealand*, in twenty-one rounds with the 12-inch, fifteen hits in two and three-quarter minutes, or almost four hits per gun. In the *Hindustan*, with a 9.2-inch, during a run of two minutes, four guns fired thirty-four rounds and made thirty-three hits, while one man actually fired ten rounds and made ten hits in two minutes. Such a thing a couple of years ago a 4.7-inch gun would not have been expected to do. It almost seems as if good luck follows in the footsteps of the Inspector of Target Practice, who was with the

Atlantic Fleet when these scores were made. The best ships in the Channel up to now are the *Prince George and Montagu*. The former, with her 12-inch guns, in fifteen rounds made eleven hits, and with her 6-inch guns in eighty rounds, sixty-seven hits, or altogether seventy-eight hits in ninety-five rounds. Two of the gunlayers in the *Prince George* each made nine hits in a minute with the 6-inch, and when they were told to fire for another forty-five seconds tied again with seven hits apiece in this period. In the *Montagu* with the 12-inch eight hits were made in thirteen rounds, and with the 6-inch seventy-three hits in 105 rounds, a total of eighty-one hits in 118 rounds. The record of the *Prince George* stands at 82 per cent of hits per round. The *Exmouth* has been firing this week, but we have not yet heard the results. It may be that Admiral Wilson's flagship will beat that of Admiral May, although at present the gunnery in the Atlantic Fleet is certainly remarkable, and if the record of the *King Edward VII, New Zealand*, and *Hindustan* is repeated everyone will be satisfied. Then attention will be turned to the Mediterranean, where Lord Charles Beresford's flagship has still to fire, and it is quite possible that the *Bulwark* may show us that no sooner has one man made a record than another lowers it. The returns so far show the enormous improvement which has been effected in individual shooting, a result only due to assiduous training and practice on the part of the men, and sympathetic care and attention on that of the officers, from the admiral downwards. The hope of everyone must be, not so much that there should result a number of marvelous performances as that a high average level should be reached by the fleet.—*Army and Navy Gazette.*

The gunlayers' test in the *Exmouth*, flagship of Admiral Sir A. K. Wilson, V. C., commander-in-chief of the Channel Fleet, which was the champion shooting vessel of the fleet last year, has now been carried out. The results so far as the 12-inch guns are concerned were: Fore turret, 7 hits in 8 rounds; after turret (C. P. O. Huston), 9 hits in 11 rounds—a total of 16 hits out of 19 rounds. This record has not been beaten yet by any other ship. The cruiser *Drake*, flagship of Rear-Admiral Prince Louis of Battenberg, has just completed her gunlayers' test with magnificent results. The firing took place on the 24th inst., off the Sardinian coast, and Rear-Admiral Sir Percy Scott, director of target practice, was on board. Eighteen rounds were fired from her two 9.2-inch guns, seventeen hits being scored, while out of 149 rounds fired from the sixteen 6-inch weapons, no less than 128 hit the target. Four Royal Marine gunlayers—Gunner Sparrow, Corporal Ward, Bombardier Nixon, and Sergeant Read—did marvelous work with 6-inch guns. They fired from their four weapons 44 projectiles, and only one failed to pierce the target, the hits being at the rate of 10.7 for each gun per minute.

The cruiser *Powerful*, flagship on the Australian station, in the heavy gunlayers' competition for this year, made 93 hits out of 110 rounds. With the 6-inch guns an average of 6.6 rounds and 5.6 hits per minute per gun were recorded, five of the guns making 8 rounds and 8 hits per minute. The average would have been even better but for a couple of miss-fires. The two 9.2 guns made 3 rounds and 2 hits and 2 rounds 2 hits per gun in two minutes. The ship's company were congratulated upon this satisfactory showing.

The cruiser *Venus*, belonging to the Mediterranean Fleet, has just accomplished a splendid performance in the gunlayers' tests among the vessels on her station. Out of 96 rounds with her 6-inch guns, 78 hits were registered. Lord Charles Beresford, commanding in the Mediterranean, congratulated the gun's crew on the result, remarking that it was all the more praiseworthy when the short time that the ship had been in commission—about two months—was taken into consideration. Of the other

vessels on the station, the *Vulcan* registered 57 hits with 70 rounds, while the *Barham* made 42 hits out of 58 rounds. With one of her 4.7 guns she made 11 hits with the same number of rounds.

In a two-minutes' run in the gunlayers' competition, off the Morocco coast, near Tetuan, Sergeant Emery, Royal Marines, serving on the *Formidable*, made eleven hits out of eleven rounds in 55 seconds. This firing is the world's record for 6-inch guns with half charges.—*United Service Gazette.*

WIRELESS TELEGRAPHY.

U. S. WIRELESS STATIONS.—At no distant date the United States Navy will have the Pacific Coast equipped with wireless stations as the Atlantic Coast is now equipped. Wireless stations have been completed and equipped at San Diego, Arquello, Faralona, and Mare Island. Faralona is just outside of San Francisco Harbor, and the station was located there in order to have the communication over sea, as much as possible from one station to the other. Stations are now being constructed at Table Bluff, Cape Blanco, North Head, and Cape Flattery. The stations are from 130 to 210 miles apart, and when they are all erected and the apparatus installed it will be possible to communicate the whole length of the Pacific Coast either in the day or night. In this connection it may be noted that after thorough experiments the government has determined that the earth formation at Montauk Point is not suited to successfully operate a wireless telegraph station. The present station is to be abandoned and all apparatus shipped to Fire Island, where a new station will be built. A De Forrest wireless telegraph station is being constructed at Saulte Ste. Marie, Ontario. It will have, it is claimed, a capacity of sending and receiving 600 miles over land and 2000 miles over water in daytime.—*Electrical World.*

THE ADMIRALTY AND THE MARCONI COMPANY.—The terms of the arrangements made between the Admiralty and the Marconi Wireless Telegraph Company have just been published as a Parliamentary paper. From this paper it appears that an agreement was executed on July 24, 1903, in which it is stated that the Marconi Company had already supplied thirty-two installations of its wireless telegraph apparatus under the terms of a previous agreement dated February 29, 1901, and that as the Admiralty may need further installations, the fresh agreement was entered upon for eleven years from April, 1903. Under this agreement the Marconi Company permits the Admiralty to have the use and exercise of their system for the purposes of the navy, of the inventions already patented, and any future inventions or improvements which may be patented within the prescribed eleven years. The company, if called upon, must also forward and receive naval messages at the current Transatlantic rate, not exceeding 5d. per word, to the exclusion of all other messages. The company also agrees to the terms of the commissioners with regard to the supply of apparatus and improvements or subsequent inventions. The Admiralty in return agree to pay the company £20,000 for the rights and privileges already mentioned, and a further sum of £1600, the amount of royalty upon the thirty-two already existing installations up to March 31, 1903. Secondly, the Admiralty agree to pay the company the sum of £5000 annually for the eleven years, due on April 30 of each year. Thirdly, the Admiralty agree to buy all instruments and apparatus used for the system from the company so long as it is in a position to supply them. Further, the Marconi system is always to be used by the Admiralty in signalling at their stations, provided, however, that the Admiralty shall be under no obligation to continue to do so if the conduct of the signalling interferes with communication with H. M.'s ships. If the Admiralty take

over a station they are to supply the company with a monthly report of the number and length of the commercial messages transmitted through its system, and pay the company any receipts therefrom. The Admiralty may not use the Marconi system to communciate with other vessels not equipped with the company's apparatus, except in cases of emergency or in time of war. In the event of the Admiralty failing to observe this condition, the company will be entitled to claim compensation in respect of the profit which would otherwise have accrued to them had the conditions been faithfully observed. On the face of it, the Admiralty appear to have tied their hands pretty completely, and to have paid heavily for so doing. Whether they have got a fair equivalent for their expenditure will probably be threshed out in Parliament.—*Army and Navy Gazette.*

The Admiralty has ordered that all masthead semaphores on warships are to be removed, this means of signalling being superseded by wireless telegraphy and searchlights.—*United Service Gazette.*

A DECADE OF WIRELESS TELEGRAPHY.—Wireless telegraphy is now ten years old. On the 2d of June, 1906, there was filed in the British Patent Office a provisional specification "for improvements in transmitting electrical impulses and signals and in apparatus therefor," by one Guglielmo Marconi, residing at No. 71 Hereford Road, Bayswater, England.

At the time this patent was applied for the art of transmitting messages without wires was wholly unknown, in so far as its practice and utilization were concerned, and the drawing and descriptions of the improvements cited gave neither the layman nor scientist an inkling that the arrangement was one of the most important since those first brought out in the allied classes of telegraphy and telephony, or that the young inventor was destined to take rank with Morse and Bell as a genius who had materially advanced civilization by devising a new means for transmission of intelligence.

Exactly a decade has elapsed since the filing of that memorable patent, and the great and far-reaching progress made in the art in the brief period past is well known. There are, however, some salient features that have been brought out in the development of the new telegraphy that are not so well known, and to these attention may be appropriately called at this particular time.

After the first successful trials were made across the Bristol Channel between Lavernoch and Flat Holm, a distance of 3.3 miles, by Marconi, and during these notable tests, in which he became cognizant of the great value of using high aerial wires and earthed terminals, the feasibility of telegraphing through space without wires by the Hertzian wave method could no longer be doubted, and all other schemes for producing similar results were abandoned.

Notwithstanding the favorable issue of the experiments, there was yet much to be done before the system could be made commercially practicable, and the young inventor labored zealously to extend the limitations that hemmed it in on all sides. Nor was he alone now in the great work that confronted him, for numerous investigators on both sides of the Atlantic became imbued with the possibilities the new art offered. To increase the range of signaling was the first and most important step, and after that, the desirability of securing selectivity, so that a number of messages could be sent in the same field of force without suffering extinction.

Marconi was perhaps the most persistent experimenter in the bridging of greater distances, while very early in the development of the new telegraphy Lodge turned his attention to the production of a selective system by means of electrical resonance. The former succeeded so well in his task, that from three miles in 1897 he was able to send and receive signals three thousand miles in 1904; while the latter, although he failed to evolve a commercially selective apparatus, led the way for the timing

of the sending and receiving circuits individually and syntonizing them collectively.

The work of Lodge and his successors has resulted in the beautiful compound open and closed oscillators and resonators, both close and loose coupled, that give, in the refined apparatus we have at the present time, the highest efficiency of operation with the least expenditure of initial energy.

Another important feature of recent date is the utilization of auto-detectors in connection with telephone receivers as receptors for the translation of incoming electric waves into the alphabetic code of dots and dashes. This adjunct may be attributed to American ingenuity, and was a difficult but well-taken step leading toward the goals of accuracy, rapidity, and simplicity, for it eliminates virtually all of the difficult adjustments found in the coherer and Morse register receptors, permitting a very great increase in the speed of reception, and greatly reduces the number of essential parts of the equipment. De Forest was probably the first in the commercial field to use the auto-detector and telephone receiver, while Fessenden has conferred a lasting benefit upon science and humanity by his ingenious detector, the liquid barretter, an instrument that in its sensibility, its ruggedness, and its simplicity is second only to the telephone receiver of Bell.

With these improvements, chiefly made within the past five years, wireless telegraphy is all that the most exacting critic could hope for, if we except selectivity, and in this especial branch of the work there is yet unlimited opportunity for the wireless inventor to exercise his ingenuity.

So much for the physical advances made during the past decade, in transmitting mesages without wires. Its usefulness as a commercial factor has been universally recognized, and not only has the mercantile marine service been very largely equipped, but the different governments are fully alive to its possibilities in time of peace and war. Not only have the ships of the world's navies and strategic shore stations been equipped with some make of apparatus, but the armies of various countries have used it overland with considerable success.

Overland wireless telegraph has been tried out commercially within the past few years; and while it is practical from the viewpoint of operation, the interference between stations leaves it a poor competitor of the wire system. It has competed more successfully with the shorter cables, and elaborate experiments are now being conducted by Prof. Fessenden and Dr. De Forest, working independently in the effort to establish permanently transatlantic cableless telegraph. Should the results prove practicable, it is extremely doubtful if they will in any way affect the cable companies, as is popularly supposed.

The wireless patent situation has been aired in the United States courts to some extent, and it would seem from the decisions handed down that the claims of Marconi in his original patent of ten years ago, *i. e.*, "a receiver having a sensitive tube or other sensitive form of imperfect contact capable of being restored with certainty and regularity to its normal condition," will be upheld during the life of the patent. As a matter of fact, the electrolytic detector or barretter of Fessenden comes under this claim, although this question has not been answered by process of law.

The present indications are that there will be no litigation between the Marconi and Fessenden interests; and in so far as the United States is concerned, there is reason to believe that of the several companies now making and selling apparatus, many will be driven entirely out of the business, one or two will be allied with the Marconi company, and the fittest only will survive, forming a parallel with the interesting case of the Bell telephone of thirty years ago. If this should prove true, it will show not only the value of fundamental patents, but that which is of equal importance, namely, to have the claims so drawn as to properly cover both methods and apparatus.—*Scientific American.*

MISCELLANEOUS.

THE YARROW MOTOR TORPEDO-BOAT.—With the advent of the torpedo-boat propelled by internal combustion engines and built by Messrs. Yarrow a new departure in the system of naval defences adapted for the protection of estuaries or harbors appears to have been inaugurated. The original idea of the torpedo-boat flotillas was that they should consist of a great number of small units, each possessing high speed, exposing a small area to gun-fire, and costing comparatively little to build. In recent years, however, two of these essential principles have been departed from, and increased speed has been the object, necessitating larger boats, until the length of these craft, beginning at 75 feet, has gradually increased to over 150 feet. As the cost of each vessel has also been proportionately greater it has followed that fewer boats have been built. It is doubtful whether this policy of fewer but larger craft has been the wiser, and whether the money might not have been better spent by a return to the former plan.

Messrs. Yarrow's motor torpedo-boat is 60 feet long by 9 feet beam, is provided with three propellers, and has a speed when loaded with three tons (an ample allowance for weight of torpedoes and fuel) of 24 knots, whilst a torpedo-boat driven by steam, and carrying the same load, would only attain to 18 knots. The radius of action of the former is 300 miles for one ton of fuel and that of the latter 60 miles. An important feature of the Yarrow motor boat is that the petrol is carried in a special tank, and this tank does not form any part of the structure of the hull, so that in case of damage none of the petrol could find its way into the interior of the boat, thus avoiding a source of possible danger. The armament of such a torpedo-boat might be either one torpedo in a revolving tube or two in dropping gear at the side, and, moreover, she could carry one ton more armament than a steam driven boat of similar capacity owing to the smaller amount of fuel she requires.

The little vessel has been subjected to exhaustive trials, the success of which have induced the Admiralty to purchase her; and, after delivery, further experiments will be made in order that the value for defensive purposes of a flotilla of such boats may be determined. In considering this subject it should be observed that a craft of this size and weight—namely, eight tons—can be transported with facility by rail from one coast to another, so that a port undefended one day might be placed in a state of defence the next. In a run made yesterday from Cowes to Southampton and back at 24 knot speed the vibration was found to be exceptionally slight, although the engines were running over 1000 revolutions a minute, their normal speed. It is suggested that the method of carrying out a system of defence with such craft would be to have special stations allotted to them, apart from a dockyard in the proximity of the mouth of any river or harbor to be defended, and it may be interesting to remark that 350 of these little vessels could be provided for the price of one *Dreadnought*. It is understood that the firm is already directing its attention to the construction of larger and more habitable boats of the same kind intended to keep the sea for longer periods.

Mr. Yarrow, in referring to the purchase of the boat by the Admiralty, said that it was only one of the many instances showing how desirous the present Board are to avail themselves of any modern improvement to increase the efficiency of the navy.—*London Times.*

COMPARATIVE NAVAL STRENGTH.—The annual parliamentary return showing the fleets of Great Britain, France, Russia, Germany, Italy, the United States of America, and Japan, has just been issued. It distinguishes the vessels built and building, gives the date of launch, and also the displacements and armaments reduced to one common scale. It is pointed out that the vessels still included in the official fighting strength of each

navy are shown in the return, except where there is information to show that vessels officially classed as effective are assigned to special and non-seagoing duties. The vessels are not transferred from the "building" to the "built" portion until they are ready for commissioning. The return is corrected to March 31 last:

BUILT.

	Gr. Britain.	France.	Russia.	Germany.	Italy.	United States.	Japan.
Battleships, 1st class	55	19	8	18	14	14	9
Battleships, 2d class	4	9	3	4	—	1	2
Battleships, 3d class	2	1	1	9	2	—	—
Coast Defence Vessels, Armored.	—	9	6	11	—	11	3
Cruisers, Armored	28	19	3	6	6	7	9
Cruisers Protected:							
1st class	21	7	6	—	—	3	2
2d class	46	14	*2	14	5	17	11
3d class	19	16	1	12	†13	2	7
Cruisers, Unprotected	—	1	‖3	‖15	1	6	7
Scouts	8	—	—	—	—	—	—
Torpedo Vessels	21	‡15	7	1	11	2	3
Torpedo Boat Destroyers	143	31	68	43	13	20	29
Torpedo Boats	87	255	172	84	128	32	79
Submarines	25	39	13	§1	2	8	5
	459	435	293	218	195	123	166

BUILDING.

Battleships, 1st class	6	6	4	6	4	11	4
To be laid down 1906-7	—	6	—	2	—	2	4
Cruisers, Armored	10	5	4	2	2	8	3
To be laid down 1906-7	—	—	—	1	—	—	2
Cruisers, Protected:							
1st class	—	—	1	—	—	—	—
2d class	—	—	—	6	—	—	1
To be laid down 1906-7	—	—	—	2	—	—	—
Scouts	—	—	—	—	—	3	—
Torpedo Boat Destroyers	18	23	29	6	4	—	35
To be laid down 1906-7	—	10	—	12	—	—	—
Torpedo Boats	—	52	—	—	20	—	—
Submarines	15	30	15	§1	4	4	2
To be laid down 1906-7	—	20	—	—	—	—	—
	49	152	53	38	34	28	39

* Including one partially protected.
† Including two partially protected.
‡ Including one torpedo depôt ship. § Experimental.
‖ Including two and six used as training-ships respectively.—*Army and Navy Gazette.*

WORLD'S STEAMSHIPS.—The annual issue of the *Bureau Veritas*, a reliable publication, gives the world's steamship tonnage, reckoning steamers of 100 tons or over only, as 14,018 ships of 28,369,140 gross tons register, against 17,352 of 27,900,457 gross tons, a year ago. The falling off in

number of steamships is due to the fact that last year a number of vessels of less than 100 tons each were registered on the list.

The ownership of this vast tonnage is chiefly:

	Steamships.	Tonnage.
Great Britain	6,079	14,919,578
Germany	1,273	3,033,333
United States	876	1,756,327
France	577	1,221,008
Norway	916	1,057,822
Japan	502	843,710
Russia	537	637,757

In steam tonnage all countries of the world made increases except France, Italy, Spain, Greece, Turkey, China, Uruguay, and Egypt.—*Nautical Gazette.*

WORLD'S SAILING SHIPS.—The day of the sailing ships for trading purposes is not over by any means. The annual issue of the *Bureau Veritas*, whose figures are always authoritative, shows the number of sailing ships, of fifty tons and over, in the world as now being 27,122 of 7,620,679 aggregate tonnage, against 25,873 of 7,811,957 tons a year ago. This means that the new sailing ships completed last year were of larger tonnage than in the years before.

The ownership of these ships is, as follows, chiefly:

	Ships.	Tonnage.
Great Britain	6,589	1,912,360
United States	3,765	1,573,178
Norway	1,647	741,970
Russia	3,243	555,165
Italy	1,500	445,002
Sweden	1,473	266,613
France	1,414	517,069
Japan	1,336	166,723

In sailing tonnage the United States, Russia, France, Sweden, Turkey, and Peru, made gains during the year.—*Nautical Gazette.*

NEW TURBINE LINERS.—The Allan Line has decided on the active development of its transatlantic service, and, as a beginning, contracts have already been drawn up for the construction of two turbine liners larger than the Virginian and Victorian, which went into commission last year.—*Nautical Gazette.*

BRITISH ADMIRALTY SURVEYS.—The "Annual Report on Admiralty Surveys" for last year has just been issued as a Parliamentary paper. The hydrographer's report states that in the course of 1905 eleven vessels were employed in the work of survey in different parts of the globe. Eighty officers of all ranks were employed in the various ships, and fifty-three of this number were surveying officers; their crews amounted to 747. Although all the ships employed in the surveying were fully occupied, bad weather hindered the progress of the work considerably, and consequently the output has not been so large as usual. However, during the year rocks and shoals to the number of 522 were discovered. Surveying vessels reported 145 of these, others of H. M.'s ships accounted for eleven, eighteen were announced by various British and foreign vessels, twenty-six were discovered by ships striking on them, and the remaining 322 were reported by colonial and foreign governments. Coastline to the extent of 1129 miles has been charted, and soundings have been made over an area of 4,295 square miles. The scale of each survey varies according to the requirements of the region surveyed, and great assistance has been afforded

by officers of H. M.'s ships not engaged officially in the survey work, who have sent in plans and sketch surveys of different localities they have visited. The importance of this survey work cannot be too greatly enlarged upon; year by year the number of rocks and shoals reported steadily increases, and the growing requirements of commerce necessitate a more detailed survey of districts in which trade is opening up. It is worth noting that in future the self-governing colonies of Canada, Australia, and New Zealand will undertake the survey of their own coasts, but some time must elapse before their marine survey departments will get into efficient working order. The expenses of surveying the New Zealand coast, which was carried out by H. M. S. *Penguin*, has partly been borne by the colony.—*Army and Navy Gazette.*

PREMIUM SYSTEM IN BRITISH DOCKYARDS.—The adoption of the premium system in the dockyards at Portsmouth, Devonport, Chatham, and Sheerness, has proved so satisfactory that the system is now being gradually extended. In practice, the premiums earned are found to average about 20 per cent over the ordinary wages.—*Page's Weekly.*

BRITISH MERCHANT MARINE AND THE COMMERCE DESTROYER.—Great Britain more than any other nation is dependent upon the existence and uninterrupted movement of her great merchant marine. In itself, and as the indispensable medium for carrying her vast commerce, the shipping fleet of the island empire is its most valuable asset. Therefore, it has been generally regarded as the most vulnerable point upon which to concentrate attack in time of war. So largely does Great Britain depend upon her over-sea commerce for food stuffs, that there would be no surer way of bringing that proud empire to its knees as a supplicant for peace than to capture, destroy, or drive from the high seas the ships that carry her food stuffs and the raw materials and finished products of her factories.

The recent naval maneuvers, in which practically the whole strength of the British Navy was concerned, were planned with a view to determine just how great this peril might be, and to this end an "enemy's fleet" was organized which, though not large in numbers, was mainly distinguished by its combination of great gun power and high speed. Among the battleships were included the five new vessels of the *King Edward VII* class, and among the cruisers was the Atlantic Squadron, which, under the command of Prince Louis of Battenberg, visited this country in the fall of last year. Although the commerce destroyer, as represented by our own *Minneapolis* and *Columbia*, has ceased to be built, its place has been taken by the modern armored cruiser, which has all the speed of the commerce destroyer, in addition to good armor protection and a heavy battery of long-range guns. The Atlantic cruiser squadron, for instance, consists of ships, the slowest of which is of 23 knots maximum speed, while the fastest, the *Drake*, made 24 to 25 knots for short distances when in chase of the enemy.

The "defending fleet" included twenty battleships of the Channel and Mediterranean Fleets, besides several squadrons of cruisers, and the plan of the maneuvers was to dispatch a large number of merchant ships across the zone of war under convoy, the vessels being sent off in groups along one of several routes between Falmouth or Milford Haven and Gibraltar. The ships, whether their course lay northward or southward, converged off Cape Finisterre, which, of course, became the central point of defense. The method of defense was for the fleet to move in sections, respectively, to the south and to the north, each preceded by a wide screen of scouts and cruisers, the widely-separated ships of each screen being kept in touch by wireless telegraphy.

The nine battleships and cruisers of the enemy rendezvoused off Cape St. Vincent, where the vessels were formed in three great lines reaching

east and west, with 30 miles between the individual ships of each line. The battleships formed the center line, while a line of cruisers was placed 120 miles to the north, and another line 120 miles to the south, the whole of this great network being kept in touch by wireless telegraph. The defending force, moving from Gibraltar and from Falmouth, quickly broke through the meshes of this net, two of the enemy's battleships and some of his slower cruisers being subsequently put out of action by the fleet from the south; the defending fleet from the north accounted for a third battleship and another large cruiser, while the *Magnificent*, the last remaining of the slower battleships of the enemy, escaped by taking to the *Atlantic*. The enemy was left with five fast battleships of the *King Edward VII* class, and the enormous value of a homogeneous squadron of uniform high speed was shown by the fact that these vessels were able to break through the theoretically overwhelming force of the enemy, and steam up the channel with the defending fleet in hopeless pursuit.

The enemy's cruisers, forming the southern edge of the net, fought an important engagement with the defending cruisers off St. Vincent, in which all of the ships on both sides were severely handled and some vessels were practically destroyed. It is significant that most of the engagement took place at 6000 yards range, at which the 6-inch gun is practically ineffective, and that the maneuvering was carried out at the high speed of 21 knots an hour. The value of speed in armored cruisers was shown when the enemy's squadron sighted the outer fringe of 25-knot scouts (a new type recently built) and gave chase. In this case the flagship *Drake* was able to raise her speed to 24.8 knots, with the result that she ultimately brought the destroyers within range, and they were ruled out of action. It is claimed, and very justly so, that the maneuvers have emphasized the value of an efficient engineering staff and have proved once more, that upon the efficiency of the staff, and not upon the mere trial records of the ships, depends their final value when put to the supreme test of war.

On the other hand, too much importance must not be placed upon the escape of the attacking fleet and its ability to raid the maritime cities along the coast, and capture and destroy merchant vessels. Such damage would be local and temporary. Only by meeting and defeating the defending fleet in a pitched battle, a feat of which the enemy was quite incapable, could any decisive result have been achieved. Although the swift cruisers of the raiding fleet succeeded in doing considerable damage to the country's commerce, they were driven from the trade route which was selected for attack, and as a fleet were badly damaged and widely scattered. Altogether, the contention of the leading naval authorities that Great Britain's commerce can never be so absolutely crippled as to decisively affect the issues of war, would seem to be strengthened by the events of this summer's maneuvers.—*Scientific American.*

BOOK NOTICES

"Organization and Tactics," 7th Edition, 1906, by the late Colonel Arthur L. Wagner, General Staff, revised by Captain Malin Craig, 1st Cavalry; Captain Herbert J. Brees, 1st Cavalry, and First-Lieutenant Leslie A. I. Chapman, 1st Cavalry, has recently appeared from the press of the Franklin Hudson Publishing Company, of Kansas City, Mo. While the revised work shows many changes, particularly in the chapters relating to reorganization, and to those treating of the arms of the different branches of the service, it still closely resembles the former editions as they were written by the late author himself. Throughout the work, it is very evident that the revisers have made every effort to imitate the clear and forcible style of Colonel Wagner, that where changes have been made necessary, the new and the old have been so blended that the closest comparison is necessary to determine in just what portions of the text the changes have been made. In the opinions of the revisers, the science of tactics has suffered no change, but the changes in organization and armament have made necessary the employment of methods differing in detail only from those laid down in the previous editions. Nothing radically new has been introduced, the revision only bringing the work up to date in matters of organization, and in the technical handling of the three arms. Each modification of the original text has been made with the sole intent of doing away with the conflict between former editions and those ideas which have been fixed by law or regulation, or else by the general concensus of opinion have been demonstrated by recent wars to indicate modern methods in handling troops in the presence of the enemy. Careful attention has been paid in consulting eminent authorities and the book may now be used as a text in the various army schools, in its entirety, as an authoritative statement on the subjects treated.
($3.00, cloth; $3.50, sheep.)

The "Mariner's Pocketbook," issued by the International Correspondence Schools, is a well arranged compilation on many subjects of interest to seafaring people. It is neatly gotten up in a small volume that may be carried in a hip pocket.

In addition to many useful tables, and the essential features of arithmetic, mensuration and trigonometry, it contains chapters embodying the elements of navigation, ordnance and ship building. It gives an outlined description of the organization of the U. S. Navy, and organization of a vessel of war, besides much other information of a nautical character useful alike to the officers and men of the navy and revenue marine service.

LIST OF PRIZE ESSAYS.

1879.

Naval Education. Prize Essay, 1879. By Lieut.-Com. A. D. Brown, U. S. N.

NAVAL EDUCATION. First Honorable Mention. By Lieut.-Com. C. F. Goodrich, U. S. N.

NAVAL EDUCATION. Second Honorable Mention. By Commander A. T. Mahan, U. S. N.

1880.

"The Naval Policy of the United States." Prize Essay, 1880. By Lieutenant Charles Belknap, U. S. N.

1881.

The Type of (I) Armored Vessel, (II) Cruiser best suited to the Present Needs of the United States. Prize Essay, 1881. By Lieutenant E. W. Very, U. S. N.

SECOND PRIZE ESSAY, 1881. By Lieutenant Seaton Schroeder, U. S. N.

1882.

Our Merchant Marine: The Causes of its Decline and the Means to be taken for its Revival. "Nil clarius aquis." Prize Essay, 1882. By Lieutenant J. D. J. Kelley, U. S. N.

"MAIS IL FAUT CULTIVER NOTRE JARDIN." Honorable Mention. By Master C. G. Calkins, U. S. N.

"SPERO MELIORA." Honorable Mention. By Lieut.-Com. F. F. Chadwick, U. S. N.

"CAUSA LATET: VIS EST NOTISSIMA." Honorable Mention. By Lieutenant R. Wainwright, U. S. N.

1883.

How may the Sphere of Usefulness of Naval Officers be extended in Time of Peace with Advantage to the Country and the Naval Service? "Pour encourager les Autres." Prize Essay, 1883. By Lieutenant Carlos G. Calkins, U. S. N.

"SEMPER PARATUS." First Honorable Mention. By Commander N. H. Farquhar, U. S. N.

"CUILIBET IN ARTE SUA CREDENDUM EST." Second Honorable Mention. By Captain A. P. Cooke, U. S. N.

1884.

The Reconstruction and Increase of the Navy. Prize Essay, 1884. By Ensign W. I. Chambers, U. S. N.

1885.

Inducements for Retaining Trained Seamen in the Navy, and Best System of Rewards for Long and Faithful Service. Prize Essay, 1885. By Commander N. H. Farquhar, U. S. N.

1886.

What Changes in Organization and Drill are Necessary to Sail and Fight Effectively Our Warships of Latest Type? "Scire quod nescias." Prize Essay, 1886. By Lieutenant Carlos G. Calkins, U. S. N.

THE RESULT OF ALL NAVAL ADMINISTRATION AND EFFORTS FINDS ITS EXPRESSION IN GOOD ORGANIZATION AND THOROUGH DRILL ON BOARD OF SUITABLE SHIPS. Honorable Mention. By Ensign W. L. Rodgers, U. S. N.

1887.

The Naval Brigade: its Organization, Equipment and Tactics. "In hoc signo vinces." Prize Essay, 1887. By Lieutenant C. T. Hutchins.

1888.

Torpedoes. Prize Essay, 1888. By Lieut.-Com. W. W. Reisinger, U.S.N.

1891.

The Enlistment, Training and Organization of Crews for our Ships of War. Prize Essay, 1891. By Ensign A. P. Niblack, U.S.N.

DISPOSITION AND EMPLOYMENT OF THE FLEET: SHIP AND SQUADRON DRILL. Honorable Mention, 1891. By Lieutenant R. C. Smith, U.S.N.

1892.

Torpedo-boats: their Organization and Conduct. Prize Essay, 1892. By Wm. Laird Clowes.

1894.

The U.S.S. Vesuvius, with Special Reference to her Pneumatic Battery. Prize Essay, 1894. By Lieut.-Com. Seaton Schroeder, U.S.N.

NAVAL REFORM. Honorable Mention, 1894. By Passed Assistant Engineer F. M. Bennett, U.S.N.

1895.

Tactical Problems in Naval Warfare. Prize Essay, 1895. By Lieut.-Com. Richard Wainwright, U.S.N.

A SUMMARY OF THE SITUATION AND OUTLOOK IN EUROPE. An Introduction to the Study of Coming War. Honorable Mention, 1895. By Richmond Pearson Hobson, Assistant Naval Constructor, U.S.N.

SUGGESTIONS FOR INCREASING THE EFFICIENCY OF OUR NEW SHIPS. Honorable Mention, 1895. By Naval Constructor Wm. J. Baxter, U.S.N.

THE BATTLE OF THE YALU. Honorable Mention, 1895. By Ensign Frank Marble, U.S.N.

1896.

The Tactics of Ships in the Line of Battle. Prize Essay, 1896. By Lieutenant A. P. Niblack, U.S.N.

THE ORGANIZATION, TRAINING AND DISCIPLINE OF THE NAVY PERSONNEL AS VIEWED FROM THE SHIP. Honorable Mention, 1896. By Lieutenant Wm. F. Fullam, U.S.N.

NAVAL APPRENTICES, INDUCEMENTS, ENLISTING AND TRAINING. The Seaman Branch of the Navy. Honorable Mention, 1896. By Ensign Ryland D. Tisdale, U.S.N.

THE COMPOSITION OF THE FLEET. Honorable Mention, 1896. By Lieutenant John M. Ellicott, U.S.N.

1897.

Torpedo-boat Policy. Prize Essay, 1897. By Lieutenant R. C. Smith, U.S.N.

A PROPOSED UNIFORM COURSE OF INSTRUCTION FOR THE NAVAL MILITIA. Honorable Mention, 1897. By H. G. Dohrman, Associate Member, U.S.N.I.

TORPEDOES IN EXERCISE AND BATTLE. Honorable Mention, 1897. By Lieutenant J. M. Ellicott, U.S.N.

1898.

Esprit de Corps: A Tract for the Times. Prize Essay, 1898. By Captain Caspar Frederick Goodrich, U.S.N.

OUR NAVAL POWER. Honorable Mention, 1898. By Lieut.-Com. Richard Wainwright, U.S.N.

TARGET PRACTICE AND THE TRAINING OF GUN CAPTAINS. Honorable Mention, 1898. By Ensign R. H. Jackson, U.S.N.

1900.

Torpedo Craft: Types and Employment. Prize Essay, 1900. By Lieutenant R. H. Jackson, U.S.N.

THE AUTOMOBILE TORPEDO AND ITS USES. Honorable Mention, 1900. By Lieutenant L. H. Chandler, U.S.N.

1901.

Naval Administration and Organization. Prize Essay, 1901. By Lieutenant John Hood, U.S.N.

1903.

Gunnery in Our Navy. The Causes of its Inferiority and Their Remedies. Prize Essay, 1903. By Professor Philip R. Alger, U.S.N.

A NAVAL TRAINING POLICY AND SYSTEM. Honorable Mention, 1903. By Lieutenant James H. Reid, U.S.N.

SYSTEMATIC TRAINING OF THE ENLISTED PERSONNEL OF THE NAVY. Honorable Mention, 1903. By Lieutenant C. L. Hussey, U.S.N.

OUR TORPEDO-BOAT FLOTILLA. The Training Needed to Insure its Efficiency. Honorable Mention, 1903. By Lieutenant E. L. Beach, U.S.N.

1904.

The Fleet and its Personnel. Prize Essay, 1904. By Lieutenant S. P. Fullinwider, U. S. N.

A PLEA FOR A HIGHER PHYSICAL, MORAL, AND INTELLECTUAL STANDARD OF THE PERSONNEL FOR THE NAVY. Honorable Mention, 1904. By Medical Inspector Howard E. Ames, U. S. N.

1905.

American Naval Policy. Prize Essay, 1905. By Commander Bradley A. Fiske, U. S. N.

THE DEPARTMENT OF THE NAVY. Honorable Mention, 1905. By Rear-Admiral Stephen B. Luce, U. S. N.

1906.

Promotion by Selection. Prize Essay, 1906. By Commander Hawley O. Rittenhouse, U. S. N.

THE ELEMENTS OF FLEET TACTICS. First Honorable Mention, 1906. By Lieut-Com. A. P. Niblack, U. S. N.

GLEANINGS FROM THE SEA OF JAPAN. Second Honorable Mention, 1906. By Captain Seaton Schroeder, U. S. N.

THE PURCHASE SYSTEM OF THE NAVY. Third Honorable Mention, 1906. By Pay Inspector J. A. Mudd, U. S. N.

NOTICE.

The U. S. Naval Institute was established in 1873, having for its object the advancement of professional and scientific knowledge in the Navy. It now enters upon its thirty-third year of existence, trusting as heretofore for its support to the officers and friends of the Navy. The members of the Board of Control cordially invite the co-operation and aid of their brother officers and others interested in the Navy, in furtherance of the aims of the Institute, by the contribution of papers and communications upon subjects of interest to the naval profession, as well as by personal support and influence.

On the subject of membership the Constitution reads as follows:

ARTICLE VII.

Sec. 1. The Institute shall consist of regular, life, honorary, and associate members.

Sec. 2. Officers of the Navy, Marine Corps, and all civil officers attached to the Naval Service, shall be entitled to become regular or life members, without ballot, on payment of dues or fee to the Secretary and Treasurer, or to the Corresponding Secretary of a Branch. Members who resign from the Navy subsequent to joining the Institute will be regarded as belonging to the class described in this Section.

Sec. 3. The Prize Essayist of each year shall be a life member without payment of fee.

Sec. 4. Honorary members shall be selected from distinguished Naval and Military Officers, and from eminent men of learning in civil life. The Secretary of the Navy shall be, *ex officio*, an honorary member. Their number shall not exceed thirty (30). Nominations for honorary members must be favorably reported by the Board of Control, and a vote equal to one-half the number of regular and life members, given by proxy or presence, shall be cast, a majority electing.

Sec. 5. Associate members shall be elected from Officers of the Army Revenue Marine, foreign officers of the Naval and Military professions, and from persons in civil life who may be interested in the purposes of the Institute.

Sec. 6. Those entitled to become associate members may be elected life members, provided that the number not officially connected with the Navy and Marine Corps shall not at any time exceed one hundred (100).

Sec. 7. Associate members and life members, other than those entitled to regular membership, shall be elected as follows: "Nominations shall be made in writing to the Secretary and Treasurer, with the name of the member making them, and such nominations shall be submitted to the Board of Control, and, if their report be favorable, the Secretary and Treasurer shall make known the result at the next meeting of the Institute, and a vote shall then be taken, a majority of votes cast by members present electing."

The Proceedings are published quarterly, and may be obtained by non-members upon application to the Secretary and Treasurer at Annapolis, Md. Inventors of articles connected with the naval profession will be afforded an opportunity of exhibiting and explaining their inventions. A description of such inventions as may be deemed by the Board of Control of use to the service will be published in the Proceedings.

Single copies of the Proceedings, $1.00. Back numbers and complete sets can be obtained by applying to the Secretary and Treasurer, Annapolis, Md.

Annual subscriptions for non-members, $3.50. Annual dues for members and associate members, $3.00. Life members fee, $30.00.

All letters should be addressed to Secretary and Treasurer, U. S. Naval Institute, Annapolis, Md., and all checks, drafts, and money orders should be made payable to his order, without using the name of that officer.

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SPECIAL NOTICE.

NAVAL INSTITUTE PRIZE ESSAY, 1907.

A prize of two hundred dollars, with a gold medal, and a life-membership in the Institute, is offered by the Naval Institute for the best essay presented on any subject pertaining to the naval profession, subject to the following rules:

1. The award for the prize shall be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.

2. Each competitor to send his essay in a sealed envelope to the Secretary and Treasurer on or before January 1, 1907. The name of the writer shall not be given in this envelope, but instead thereof a motto. Accompanying the essay a separate sealed envelope will be sent to the Secretary and Treasurer, with the motto on the outside and writer's name and motto inside. This envelope is not to be opened until after the decision of the Board.

3. The successful essay to be published in the Proceedings of the Institute; and the essays of other competitors, receiving honorable mention, to be published also, at the discretion of the Board of Control; and no change shall be made in the text of any competitive essay, published in the Proceedings of the Institute, after it leaves the hands of the Board.

4. If, in the opinion of the Board of Control, the best essay presented is not of sufficient merit to be awarded the prize, it may receive "Honorable Mention" or such other distinction as the Board may decide.

5. In case one or more essays receive "Honorable Mention," the writer of the first of them in order of merit will receive seventy-five dollars and a life-membership in the Institute.

6. Any essay not having received honorable mention, may be published also, at the discretion of the Board of Control, but only with the consent of the author.

7. The essay is limited to fifty (50) printed pages of the Proceedings of the Institute.

8. All essays submitted must be either typewritten or copied in a clear and legible hand.

9. In the event of the prize being awarded to the winner of a previous year, a gold clasp, suitably engraved, will be given in lieu of the gold medal.

By direction of the Board of Control.

PHILIP R. ALGER,
Professor, U. S. N., Secretary and Treasurer.

THE START FROM SOLOMON'S ISLAND.